The State of New Jersey
Department of Environmental Protection

State Implementation Plan (SIP) Revision
for the
Attainment and Maintenance of the
Ozone
National Ambient Air Quality Standards

2015 70 ppb 8-Hour Ozone Attainment Demonstration,
Moderate Classification,
Northern New Jersey-New York-Connecticut
Nonattainment Area
and
Southern New Jersey-Pennsylvania-Delaware-Maryland
Nonattainment Area

June 2024

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***NOTE:** These Appendices are only available electronically

ACRONYMS AND ABBREVIATIONS

ACO	Administrative Consent Order
ACT	Alternative Control Technique
AEL	Alternative Emission Limit
AERR	Air Emission Reporting Requirements
AMCC	Aftermarket Catalytic Converter
As	Arsenic
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
BEIS	Biogenic Emission Inventory System
CAA	Clean Air Act
CAMD	Clean Air Markets Division
CASTNET	Clean Air Status and Trends Network
CCTM	CMAQ Chemical-Transport Model
CDD	Clean Data Determination
CEM	Continuous Emission Monitoring
CENSARA	Central States Air Resources Agencies
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Model
CO	Carbon Monoxide
CONUS	Continental/Contiguous United States
Cr	Chromium
CSAPR	Cross-State Air Pollution Rule
CTG	Control Technique Guideline
DG/DR	Distributed Generation/Demand Response
DV	Design Value
EAC	Early Action Compact
EE	Exceptional Event
EEA	Energy Emergency Alert
EGU	Electric Generating Unit
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
FCCU	Fluid Catalytic Cracking Unit
FCU	Fluid Cooking Unit
Fed. Reg.	Federal Register
FIP	Federal Implementation Plan
FMVCP	Federal Motor Vehicle Control Program
FRM	Federal Reference Method
FSEL	Facility-Specific Emission Limit
GEOS	Goddard Earth Observing System
HC	Hydrocarbon
HCl	Hydrogen Chloride
HEDD	High Electric Demand Day
HF	Hydrogen Fluoride
Hg	Mercury
hp	horsepower
ICI	Industrial, Commercial and Institutional
IM	Inspection and Maintenance
IMO	International Maritime Organization
kW	Kilowatt

LADCO/MWRPO	Lake Michigan Air Directors Consortium/ Midwest Regional Planning Organization
LAER	Lowest Achievable Emission Rate
lbs.	Pounds
LDAR	Leak Detection and Repair
LEV	Low Emission Vehicle
MACT	Maximum Available Control Technology
MANE-VU	Mid-Atlantic Northeast Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
MARPOL	International Convention for the Prevention of Pollution from ships
MATS	Mercury and Air Toxics Standards
MCIP	Meteorology-Chemistry Interface Processor
MMBtu	Million British Thermal Units
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NACAA	National Association of Clean Air Agencies
NEI	National Emission Inventory
NESCAUM	Northeast States for Coordinated Air Use Management
NESHAP	National Emission Standard for Hazardous Air Pollutants
Ni	Nickel
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJLEV	New Jersey Low Emission Vehicle Program
N.J.R.	New Jersey Register
NJTPA	North Jersey Transportation Planning Authority
NLEV	National Low Emission Vehicle Program
NMOG	Non-Methane Organic Gas
NNSR	Nonattainment New Source Review
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
NYSDEC	New York Department of Environmental Conservation
OBD	On-Board Diagnostics
OTC	Ozone Transport Commission
OTR	Ozone Transport Region
PFC	Portable Fuel Container
PM2.5	Fine Particulate Matter
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
PSEG	Public Service Electric and Gas Company
RACM	Reasonably Available Control Measure
RACT	Reasonably Available Control Technology
RFF	Relative Response Factor
RFP	Reasonable Further Progress
RICE	Reciprocating Internal Combustion Engine
ROP	Rate of Progress
RVP	Reid Vapor Pressure

RWC	Residential Wood Combustion
SESARM	Southeastern States Air Resource Managers
SCR	Selective Catalytic Reduction
SJPC	South Jersey Port Corporation
SMOKE	Sparse Matrix Operator Kernel Emissions/Inventory Data Analyzer
SNCR	Selective Non-Catalytic Reduction
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOTA	State of the Art
TCM	Transportation Control Measure
TMA	Transportation Management Association
tpd	tons per day
tpy	tons per year
TSD	Technical Support Document
USC	United States Code
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WOE	Weight of Evidence
WRF	Weather Research and Forecasting
ZEV	Zero Emission Vehicle

EXECUTIVE SUMMARY

The purpose of this State Implementation Plan (SIP) revision is to address the requirements of the Clean Air Act (CAA) regarding New Jersey's plan for attaining the 2015 70 ppb 8-hour ozone National Ambient Air Quality Standard (NAAQS) in its Northern New Jersey-New York-Connecticut (NJ-NY-CT) Nonattainment Area and its Southern New Jersey-Pennsylvania-Delaware-Maryland (NJ-PA-DE-MD) Nonattainment Area by the attainment date of August 3, 2024. Although attainment for the entire area has not been demonstrated, New Jersey has satisfied its contributions toward attainment of the 70 ppb ozone NAAQS and has met its obligations for the achievement of Reasonable Further Progress (RFP).

This SIP revision demonstrates that New Jersey has made great strides in reducing its ozone levels, including its contribution to downwind ozone concentrations. New Jersey has implemented several significant control measures to reduce ozone precursors, nitrogen dioxide (NO_x) and volatile organic compounds (VOCs), including some measures that are more stringent than other states within its nonattainment area, including those regulating power generation. These measures are of significant importance for ozone reduction as peak power generation occurs on hot summer days when elevated ozone concentrations typically occur.

Although New Jersey has done its share to address ozone, attainment of the standard is not dependent on local reduction measures alone. The transport of ozone from sources upwind of the nonattainment areas continues to contribute significantly to ozone concentrations, particularly at monitors located in Connecticut. USEPA finalized the Good Neighbor (GN) Plan for the 2015 Ozone NAAQS on March 15, 2023. While some reductions are required ahead of the August 3, 2024, attainment deadline, other emissions reductions will not occur until 2026 ozone season. Modeling performed for the 2015 GN Plan predicts that monitors in the Northern NJ-NY-CT Nonattainment Area will not attain in 2023. Therefore, the Good Neighbor plan does not provide enough reductions needed for the Northern area to meet the Moderate attainment deadline. Additionally, the largest source sector contributing to NO_x emissions within the nonattainment area and the region continues to be mobile sources. States are limited in their authority to address these emissions. New Jersey has made significant progress in adopting rules that address mobile source emissions, however Federal measures are still needed to achieve emission reductions from this sector in upwind states choosing not to implement Section 177 control measures.

Air Monitoring Trends

New Jersey

The 2023 certified monitoring data for New Jersey with the exceptional events included shows that all of the New Jersey monitors are below the 70 ppb standard, with the exception of Rutgers at 71 ppb, which was most likely influenced by the significant wildfires. Statewide 8-hour ozone maximum design values in New Jersey have decreased approximately 48 percent from 1988-2022. All-time low design values of 68 ppb were calculated in 2022 in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area and 69 ppb in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area.

Northern NJ-NY-CT Nonattainment Area

As of December 18, 2023, preliminary monitoring data for the Northern NJ-NY-CT nonattainment area for the 2023 ozone season indicates that the highest design values continue

to be the four monitors on the north side of the Long Island Sound in Connecticut. The data shows 82 ppb at Westport, 82 ppb at Stratford, 79 ppb at Madison, and 79 ppb at Greenwich. However, the preliminary 2023 data includes pollution influences from exceptional events due to significant wildfires in Canada.

The maximum 8-hour ozone design values in the Northern NJ-NY-CT Nonattainment Area have decreased approximately 24 percent from 1999-2022. The maximum design values for the nonattainment area show a slight decreasing trend of approximately 5 percent from 2014 to 2022. However, the maximum design values in the New Jersey portion of the northern area from 2014 to 2022 show a decreasing trend of approximately 8 percent.

Southern NJ-PA-DE-MD Nonattainment Area

As of December 18, 2023, preliminary monitoring data for Southern NJ-PA-DE-MD nonattainment area for the 2023 ozone season indicates that the highest design value is 73 ppb at the Bucks (Bristol) monitor in PA. However, the preliminary 2023 data includes pollution influences from exceptional events due to significant wildfires in Canada.

The maximum 8-hour ozone design values in the Southern NJ-PA-DE-MD Nonattainment Area have decreased approximately 35 percent from 1999-2022. The design values for the southern area increased from 72 ppb to 73 ppb from 2022 to preliminary 2023, with the exceptional events included in 2023. The maximum design values for the nonattainment area show a decreasing trend of approximately 6 percent from 2014 to 2022 and 5 percent from 2014 to preliminary 2023. However, the maximum design values in the New Jersey portion of the southern area from 2014 to 2022 show a decreasing trend of approximately 9 percent. The annual 4th high ozone concentration in the area reached an all-time low in 2022 of 70ppb. The annual 4th high was 74 ppb in preliminary 2023 with exceptional events included.

Emission Inventories

This SIP revision includes an update to the statewide 2017 air emissions inventory that was submitted in the November 2021 SIP to incorporate the latest MOVES model, MOVES3.1. The 2017 inventory is the base year inventory for Reasonable Further Progress (RFP) for the 2015 70 ppb 8-hour ozone NAAQS. This SIP also includes a new 2023 projection inventory to meet the RFP requirements for the 70 ppb standard for New Jersey's northern and southern nonattainment areas. This SIP also includes a summary of the regional modeling inventory used in the attainment demonstration for the 70 ppb standard.

For the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area, VOC emissions are estimated to decrease by 17 summer tons per day (tpd) or 6 percent. NO_x emissions are estimated to decrease by 59 summer tpd or 25 percent. CO emissions are estimated to decrease by 144 summer tpd or 10 percent. For the New Jersey For the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area, VOC emissions are estimated to decrease by 13 summer tpd or 9 percent. NO_x emissions are estimated to decrease by 27 summer tpd or 23 percent. CO emissions are estimated to decrease by 78 summer tpd or 11 percent. For both of the New Jersey portions of the Northern NJ-NY-CT and Southern NJ-PA-DE-MD Nonattainment areas, the largest decreases of VOC, NO_x and CO are from the onroad mobile source sector.

New Jersey is again certifying that its emissions statement program obligations have been satisfied for the 2015 8-hour ozone NAAQS for the northern and southern nonattainment areas.

RFP

New Jersey has met its RFP demonstration requirements. New Jersey's Northern NJ-NY-CT Nonattainment Area has achieved a total reduction in VOC and NO_x summer tons per day emissions of 31 percent between 2017 and 2023. This is more than twice the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

New Jersey's Southern NJ-PA-DE-MD Nonattainment Area has achieved a total reduction in VOC and NO_x summer tons per day emissions of 28 percent between 2017 and 2023. This is nearly twice the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

Control Measures

New Jersey has met its obligation for implementing control measures to address its contribution to ozone nonattainment within the nonattainment areas. The decreasing trends in emissions and monitoring values demonstrate the effectiveness of New Jersey's rules. New Jersey has met Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT) requirements and has gone beyond RACM and RACT by adopting control measures more stringent than existing Federal Rules, Control Technique Guidelines (CTGs) and neighboring state rules, especially those of most importance that address NO_x on high ozone days, thereby setting the standard for modern RACT Requirements. Most specifically are New Jersey's rules for:

Power Plants

New Jersey has enforceable, short term, performance standards for NO_x and VOC emissions from power plants (or EGUs) that are among the most stringent and effective air pollution control regulations in the country. New Jersey took the lead in adopting measures to address emissions from EGUs that operate on High Electric Demand Days (HEDD) when ozone concentrations tend to be elevated. These sources are critically important contributors to episodes of elevated ozone in the Northern NJ-NY-CT Nonattainment Area.

All major facility permits for new EGU sources issued by the Department limit NO_x emissions based on hourly or daily averaging times, which are monitored by continuous emissions monitors (CEMs) and stack testing. These shorter averaging times lower NO_x emissions on a daily basis during the summertime, when they are needed most to control outdoor ozone levels, while still meeting an annual or ozone season cap. New Jersey's EGU rules include similar short-term emission limits for existing sources of NO_x, including all existing coal, oil and gas fired EGU's. Due to several New Jersey control measures that addressed pollution from EGUs in New Jersey, the final three coal EGUs in New Jersey ceased operation in 2022.

New Jersey's EGU rules more effectively control ozone levels than certain USEPA rules, such as CSAPR Trading Programs, because New Jersey's facilities must meet daily NO_x performance standards for all units, while facilities in other states may, under the Federal rules, purchase allowances to cover their excess emissions on high energy demand days. New Jersey's daily enforceable emission limitations better address ozone nonattainment than emission trading programs that allow the averaging of NO_x emissions over the entire summer. Five-month compliance periods are insufficient to ensure attainment of the ozone NAAQS because emissions can be high on days when ozone levels are high. Five-month averaging does not sufficiently lower emissions on

the hottest summer days when peak electric demand and peak ozone levels usually occur. Unlike other states that significantly impact New Jersey's air quality, New Jersey power plants cannot turn off their NO_x pollution controls and use excess NO_x allowances to meet emission limits.

USEPA's CSAPR ozone season trading programs are inadequate to address NO_x emissions from HEDD units that are preferentially used on high temperature, high ozone days. New Jersey has reduced NO_x emissions from power plants an estimated 64 tons per day on HEDD since implementation of the rule, with Phase I in 2009 and Phase II in 2015.

Distributed Generation/Demand Response (DG/DR)

New Jersey's rules for stationary reciprocating internal combustion engines (RICE) do not allow the use of uncontrolled engines for the purpose of distributed electric generation or demand response in non-emergency situations. However, in some states contributing to nonattainment these engines are uncontrolled and used to assist the electric grid during high electric demand periods. The emissions from these units are not properly accounted for in states inventories, or in the USEPA National Emissions Inventory (NEI) and they are not properly temporalized in the modeling. Like HEDD EGUs, many of these engines operate on hot summer days, which usually coincide with the high ozone days. Emissions from these units in the New York City Metropolitan/Long Island area on peak ozone days may be significantly contributing to ozone formation.

New Jersey Mobile Source Controls

New Jersey is addressing emissions from mobile sources to the extent that state action on mobile source control measures is not pre-empted by the Clean Air Act. New Jersey has adopted several significant mobile source control measures and implemented several significant voluntary programs. Adopted measures include NJLEV, Vehicle Idling, Heavy Duty Inspection and Maintenance (I/M) OBD, Advanced Clean Trucks (ACT), Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, Heavy Duty New Engine Standards (Omnibus), Medium Duty Diesel Vehicles (MDDVs) I/M and Advanced Clean Cars II. Other states have not adopted some or all of these rules.

Area Source VOC Rules

New Jersey has implemented several area source VOC control measures, which are more stringent than Federal standards, many based on stringent California standards. These include rules for consumer products including hairspray, insecticides, household cleaners, air fresheners, automotive brake cleaners, carpet and upholstery cleaners and household adhesives, paints, stains and varnishes, automotive refinishing, industrial and commercial adhesives, asphalt paving and solvent degreasing.

State of the art (SOTA)

SOTA air pollution control must be implemented for significant equipment at major and minor facilities for new or modified VOC and NO_x sources of air pollution.

Petroleum Storage

New Jersey has implemented one of the most stringent petroleum storage rules in the country, which established requirements to reduce VOC emissions from bulk petroleum storage facilities.

RACT

New Jersey submitted its statewide RACT analysis SIP Revision on November 19, 2021[1], for the 2015 70 ppb 8-hour ozone NAAQS for a moderate classification. As demonstrated in the 2021 Ozone SIP, New Jersey again certifies that all RACT obligations have been satisfied for the 2015 8-hour ozone NAAQS moderate classification for the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area and the Southern NJ-PA-DE-MD Nonattainment Area, as well as for the Ozone Transport Region (OTR).

Control Measures Being Submitted as SIP Revisions

On December 2, 2022, New Jersey adopted rules at 7:27F-2 that set new Electric Generating Unit (EGU) emission limits starting June 1, 2024. On December 2, 2022, New Jersey also adopted rules at 7:27F-3 that ban #4 and #6 fuel oil, with a compliance date in 2025 and a two year sell through period. These rules reduce emissions of carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxides (NO_x), fine particulates (PM2.5), sulfur dioxide (SO2) and volatile organic compounds (VOC).

The NJDEP is including these rules in this SIP Revision with the intention of submitting the adopted rules to USEPA for incorporation into New Jersey's ozone SIP.

Motor Vehicle Inspection and Maintenance (I/M) Program Certification and Performance Standard Modeling

New Jersey has implemented and maintained a statewide Enhanced I/M program for decades that meets the criteria established by USEPA regulations for an Enhanced program. The implementation of this program continues to be an integral part of New Jersey's plan to attain and maintain compliance with the NAAQS for ozone. This SIP includes updated performance standard modeling in accordance with USEPA requirements. New Jersey certifies that its rules at N.J.A.C. 7:27-14 and 15, N.J.A.C. 7:27B-4 and B-5 and the Motor Vehicle Commission (MVC) rules at N.J.A.C. 13:20-43, satisfy federal requirements for an enhanced motor vehicle I/M Program for the 2015 70 ppb 8-hour ozone NAAQS for the New Jersey portions of the Northern NJ-NY-CT Nonattainment Area, Southern NJ-PA-DE-MD Nonattainment Area and statewide in New Jersey.

[1] The State of New Jersey, Department of Environmental Protection, State Implementation Plan (SIP) Revisions, 2008 75 ppb 8-Hour Ozone Attainment Demonstration Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications and 2017 Periodic Emissions Inventory75 ppb 8-Hour Ozone National Ambient Air Quality Standard, November 18, 2021.

Phase II Vapor Recovery

New Jersey again certifies that its Phase II vapor recovery rules at N.J.A.C. 7-27-16.3, and associated amendments and SIP revision, are in accordance with Federal requirements for the 2015 70 ppb 8-hour ozone NAAQS.

Clean Fuel for Fleets

New Jersey certifies that it has satisfied the requirements (as specified in 40 CFR Part 88) for a Clean Fuel Fleets program because new vehicles sold in the state meet or are more stringent than the federal certification standards under 40 CFR Part 86, Subpart S or Part 1036.

New Jersey Coal Electric Generating Plants

New Jersey has been a leader in reducing air pollution from Electric Generating Units (EGUs). Due to several New Jersey control measures that addressed pollution from EGUs in New Jersey, the final three coal EGUs in New Jersey ceased operation in 2022.

Additional Control Measures and Initiatives

Clean Energy

New Jersey is a national leader in reducing emissions from the electric power sector. In addition to its adopted air pollution rules, New Jersey has recently implemented several actions that will increase renewable energy, thereby resulting in further reductions in ozone and PM precursor emissions from the New Jersey electric power sector. These measures include:

- Offshore Wind Goals: Governor Murphy signed three Executive Orders[2,3,4] that direct all New Jersey state agencies with responsibilities under the Offshore Wind Economic Development Act to fully implement it. The Orders also established goals to increase New Jersey's offshore wind power to 11,000 megawatts by 2040.

- Regional Greenhouse Gas Initiative (RGGI): RGGI is the first mandatory market-based program in the United States to reduce greenhouse gas emissions from the power sector. New Jersey's participation in RGGI is part of Governor Murphy's goal to achieve 100% clean energy by 2050. On June 17, 2019, New Jersey formally rejoined RGGI when the Department adopted two rules.[5] While GHG reductions are outside the scope of this SIP, it has been shown that GHG reductions will have a co-benefit of NO_X/VOC reductions.

- Clean Energy Act: On May 23, 2018, Governor Murphy signed the New Jersey Clean Energy Act (P.L.2018, c.17). The Act strengthened New Jersey's Renewable Portfolio Standard by requiring 35% renewable power by 2025 and 50% renewable power by 2030. It also requires energy efficiency measures to reduce annual electricity usage by 2% and annual natural gas usage by 0.75% and codifies goals for offshore wind and energy storage.

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[2] Executive Order #8, January 31, 2018. https://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf
[3] Executive Order #92, November 21, 2019. https://nj.gov/infobank/eo/056murphy/pdf/EO-92.pdf
[4] Executive Order #307, September 21, 2022. https://nj.gov/infobank/eo/056murphy/pdf/EO-307.pdf
[5] The Carbon Dioxide Budget Trading Rule and the Global Warming Solutions Fund rule, June 17, 2019.

New Jersey Protecting Against Climate Threats (NJPACT) Rules

On January 27, 2020, Governor Murphy signed Executive Order Number 100 (EO 100) that initiated a targeted regulatory reform effort that will modernize New Jersey environmental laws. EO 100 is referred to as Protecting Against Climate Threats (NJ PACT). NJ PACT will usher in systemic change, modernizing air quality and environmental land use regulations, that will enable governments, businesses, and residents to effectively respond to current climate threats and reduce future climate damages.

As a national leader in environmental protection, the NJDEP has and will continue to create a regulatory roadmap to reduce emissions, build resilience, and adapt to a changing climate. This includes the enactment of new air pollution regulations that achieve critically needed reductions in carbon dioxide and short-lived climate pollutants (e.g., methane and black carbon) including technology-forcing measures that pave the way for a clean-energy economy.

Based on this EO, New Jersey has adopted several rules including Advanced Clean Trucks (ACT), new EGU Emission Limits, a #4 and #6 Fuel Oil Ban, regulations for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, Heavy Duty New Engine Standards (Omnibus), Medium Duty Diesel Vehicles (MDDVs) I/M and Advanced Clean Cars II.

Electric Vehicles

In addition to the control measures discussed above, New Jersey continues to implement several initiatives towards its goal of transitioning from fossil fuel-powered vehicles to electric vehicles. New Jersey will continue to develop sufficient electric vehicle (EV) infrastructure, conduct education outreach, and provide incentives through funding and grant programs. On January 17, 2020, Governor Murphy signed landmark legislation that established goals and incentives for the increased use of plug-in electric vehicles in New Jersey. This legislation establishes New Jersey as a leader in attracting electric vehicles to the state thereby making significant contributions to the attainment of existing air pollution and energy goals. In 2011, only 338 electric vehicles were registered in the State. As of June 2023, 123,551 electric vehicles, including battery electric vehicles and plug-in hybrid electric vehicles, are registered in the State, marking a significant increase over the ten-year period. The NJDEP Electric School Bus Grant program is designed to encourage and monitor the transition to electric school buses throughout the state.

Regional Haze "Asks"

Included in New Jersey's Regional Haze SIP was a list of "asks" for states that contribute to visibility impairment to consider undertaking as air pollution control measures in their Regional Haze SIPs. The "asks" addressed emissions of SO_2 and NO_X from states within and outside of the MANEVU Region. The "Asks" include more stringent controls for electric generating units (EGUs) including peaking combustion turbines, evaluation of emission sources to determine reasonable installation or upgrade of emission controls, adoption of MANEVU's 2007 ultra-low sulfur fuel oil standard, locking in lower emission rates by updating permits, enforceable agreements, and/or rules, and increased use of energy efficiency measures and other clean technologies including fuel cells, wind, and solar.

The "asks" also include a request for the Federal Land Managers consult with MANEVU Class I area states when scheduling prescribed burns, and USEPA to develop measures that will further reduce emissions from heavy-duty onroad vehicles and ensure that Class I Area state "asks" are addressed by states identified as significantly contributing to MANEVU Class I areas.

Other SIP Components

This SIP revision was prepared in accordance with USEPA requirements and guidance regarding photochemical modeling for attainment demonstrations, transportation conformity and contingency measures.

Nonattainment New Source Review (NNSR) Certification

New Jersey is again certifying that its existing USEPA-approved NNSR rules codified at N.J.A.C. 7:27-18 are at least as stringent as the Federal requirements at 40 CFR 51.165 for ozone and its precursors for the New Jersey portions of the Northern NJ-NY-CT and Southern NJ-PA-DE-MD Nonattainment Areas current classification of moderate for the 2015 70 ppb 8-hour ozone NAAQS.

Conclusions

Northern NJ-NY-CT Nonattainment Area

New Jersey does not anticipate attainment of the 2015 70 ppb 8-hour ozone NAAQS for the Northern NJ-NY-CT Nonattainment Area without additional control measure benefits that will be achieved after the 2023 compliance year. However, New Jersey, other states in the nonattainment area and the Federal government have adopted several regulations that will achieve significant benefits after 2023. New Jersey's control measures include new EGU Emission Limits, Advanced Clean Trucks, Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, a #4 and #6 Fuel Oil Combustion Ban, Heavy Duty IM OBD, Medium Duty Diesel Vehicles IM, Advanced Clean Cars II and Heavy Duty New Engine Standards (Omnibus). The Federal government has adopted the Good Neighbor Plan for the 2015 Ozone National Ambient Air Quality Standards, Greenhouse Gas Emission Standards for Passenger Cars and Light Trucks, new Heavy-Duty Engine and Vehicle Standards and new rules for Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-duty and Medium-Duty Vehicles and new rules for Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3.

New Jersey has met its RFP demonstration requirements. New Jersey's Northern nonattainment area has achieved an estimated total reduction in VOC and NO_x summer tons per day emissions of 31 percent between 2017 and 2023. This is more than twice the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

Following are additional recommendations to achieve compliance:

- Transport

  While USEPA has made significant strides regarding transport rules, more can and still needs be done by USEPA, including lower enforceable daily NOx performance standards for EGUs and distributed generation units, like those implemented in New Jersey and other states. And the timeline for implementation of new caps, limits and/or controls should be shortened. The rule does not eliminate significant contribution within the timeframe required by the CAA.

- Rules That Address Power Generation Emissions in New York

  The New York metropolitan area is directly upwind of the controlling Connecticut monitors, with the Long Island Sound waterbody in between. New Jersey has adopted measures to address emissions from EGU sources that operate on high electric demand days, when ozone concentrations tend to be elevated, that were effective in 2009, 2013, 2014 and 2015, prior to the current attainment dates. On December 31, 2019, New York adopted a rule that addresses NO_x emissions from peaking combustion turbine EGUs with compliance dates of May 1, 2023 (100 ppm limit) and May 1, 2025 (25 ppm limit for gas and 42 ppm limit for oil). On March 11, 2020, New York adopted a regulation, 6 NYCRR Part 222, that establishes performance standards for distributed generation sources with a compliance date of May 1, 2021.

  It is important for upwind states to implement measures to reduce emissions from electric generation on high electric demand days, including electric generating units in CAMD, smaller electric generating units and behind-the-meter demand response units. These rules will assist New York in meeting its good neighbor requirements and assist in achieving attainment of the 70 ppb ozone standard in the Northern NJ-NY-CT Nonattainment Area. However, some of the New York EGU limits are effective after the 2023 compliance ozone season for this attainment demonstration and New Jersey's stationary generator rule is more stringent than New York's based on applicability thresholds, effective date of emissions limits, and exemptions. New Jersey rules are also implemented statewide while New York's distributed generation rule is limited in scope to the New York Metropolitan area.

- New Jersey RACT Rules in Other States

  Nonattainment area and upwind states should adopt and implement control measures that meet RACT standards like those in New Jersey for sources such as HEDD power generation, DG/DR power generation and municipal waste combustors. In addition, the upwind states should adopt presumptive NO_x emission limits and averaging time requirements like New Jersey and should not allow the buying of allowances to facilitate reduced operation of air pollution controls.

- Mobile Source Rules

  States in the nonattainment areas and upwind states should adopt mobile source measures like those in New Jersey.

Reclassification Request for Northern NJ-NY-CT Nonattainment Area

As discussed in New Jersey's letter to USEPA dated May 23, 2024, based on monitoring data and modeling data, New Jersey requests a voluntary reclassification for the Northern NJ-NY-CT Nonattainment Area from Moderate to Severe, with a new attainment date of August 3, 2033. If the other states in New Jersey's Northern NJ-NY-CT Nonattainment Area are not agreeable to a voluntary reclassification to Severe, New Jersey requests a voluntary reclassification from Moderate to Serious with a new attainment date of August 3, 2027.

Southern NJ-PA-DE-MD Nonattainment Area

Although 2023 data is preliminary, the Southern NJ-PA-DE-MD Nonattainment Area did not attain the 2015 70 ppb 8-hour ozone NAAQS by the 2023 compliance ozone season. The area experienced significant ozone air quality impacts due to smoke from wildfires in 2023, therefore, the data is not representative of ambient conditions. The states in the nonattainment area are submitting requests to exclude the exceptional events data from 2023. With approval of these exclusions, and a one-year extension of the attainment date to August 3, 2025, New Jersey believes the data shows that the area will attain by this date.

New Jersey has met its RFP demonstration requirements. New Jersey's Southern nonattainment area has achieved an estimated total reduction in VOC and NO_x summer tons per day emissions of 26 percent between 2017 and 2023. This is nearly twice the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

Chapter 1 INTRODUCTION and BACKGROUND

1.1 Introduction

The purpose of this State Implementation Plan (SIP) revision is to meet the requirements of Clean Air Act (CAA) Section 110(a)(1) (or 42 U.S.C. §7410(a)(1)) to submit New Jersey's plan for attaining the 2015 70 ppb 8-hour ozone National Ambient Air Quality Standard (NAAQS) in its Northern and Southern New Jersey multi-state nonattainment areas by its attainment date of August 3, 2024. Although attainment for the entire area has not been achieved, New Jersey has addressed its contributions toward attainment of the 70 ppb ozone NAAQS and has met its obligations for the achievement of Reasonable Further Progress (RFP) and Reasonably Available Control Technology (RACT).

In accordance with 40 CFR §51.112 attainment demonstrations must show that the control measures contained within the SIP are adequate to provide for the timely attainment and maintenance of the NAAQS. Each demonstration must include*:*

- A summary of the computations, assumptions, and judgments used to determine the degree of reduction of emissions (or reductions in the growth of emissions) that will result from the implementation of the control strategy;
- A presentation of emission levels expected to result from implementation of each measure of the control strategy;
- A presentation of the air quality levels expected to result from implementation of the overall control strategy showing expected maximum pollutant concentration;
- A description of the dispersion models used to project air quality and to evaluate control strategies; and
- For interstate regions, the analysis from each constituent State must, where practicable, be based upon the same regional emission inventory and air quality baseline.

In accordance with the 2018 Ozone Implementation Rule[6] for the 2015 70 ppb 8-hour ozone NAAQS an attainment demonstration consists of the following:

- Technical analyses, such as base year and future year modeling of emissions, which identify sources and quantify emissions from those sources that are contributing to nonattainment;
- Analyses of future year emissions reductions and air quality improvement resulting from existing (i.e., already adopted or ‘‘on the books’’) national, regional and local programs, and potential new local measures needed for attainment, including Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT) for the area;
- A list of adopted measures (including RACT) with schedules for implementation and other means and techniques necessary and appropriate for demonstrating attainment as expeditiously as practicable but no later than the outside attainment date for the area's classification;
- A RACM analysis to determine whether any additional RACM measures could advance attainment by 1 year.

[6] 83 Fed. Reg. 62998 (December 6, 2018)

The CAA provides the United States Environmental Protection Agency (USEPA) with the authority to set primary and secondary standards for criteria air pollutants. The primary standard protects human health, and the secondary welfare standard is designed to protect against any potential environmental and/or property damage. These standards are known as the NAAQS. The criteria pollutants covered by the NAAQS are ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM10) and fine particulate matter (PM2.5) and lead. The 1990 CAA Amendments furthered the mission to reducing air contaminants nationwide by addressing interstate movement of air pollution, emissions control measures, permits, enforcement, deadlines, and public participation to achieve and maintain those air quality standards.

The CAA Section 109 (or 42 U.S.C. §7409) further requires the USEPA to review and, if appropriate, revise the NAAQS for each criteria air pollutant every five years to insure they continue to adequately protect human health and welfare.

When an area does not meet the NAAQS for one or more criteria pollutants, the area is subject to the formal rulemaking process by the USEPA, which designates the area as nonattainment for that pollutant. The CAA further classifies ozone, carbon monoxide, and particulate matter nonattainment areas based on the magnitude of an area's air quality problem. Nonattainment classifications vary in SIP requirements and attainment dates. The technical details underlying these classifications are discussed in the Code of Federal Regulations, Part 81 (40 CFR Part 81).

The CAA contains two sets of provisions – Subpart 1 and Subpart 2 – which address planning, attainment and control requirements for ozone nonattainment areas.[7] Subpart 1, referred to as "basic" nonattainment, contains general, less prescriptive, requirements for nonattainment areas for any pollutant – including ozone – governed by a NAAQS. Subpart 2 sets forth a classification scheme for ozone nonattainment areas and provides more specific requirements for ozone nonattainment areas.[8] Under Subpart 2, the ozone nonattainment areas are classified based on the severity of their ozone levels, as determined by the area's "design value," (which represents air quality in the area for the most recent 3 years).[9] The possible classifications are marginal, moderate, serious, severe, and extreme. Nonattainment areas with a "lower" classification have ozone levels that are closer to the standard than areas with a "higher" classification. Areas in the lower classification levels have fewer and/or less stringent mandatory air quality planning and control requirements than those in the higher classifications. Areas with greater levels of ozone pollution are subject to more prescriptive requirements and are given a longer period to attain the standard. The requirements are designed to bring areas into attainment by their specified attainment dates.

CAA Section 179 (or 42 U.S.C. §7509) requires sanctions when a State fails to submit a timely and approvable plan or fails to fully implement its commitments. First, the State could face serious economic development constraints. Specifically, the USEPA could order that any proposed new air pollution source in the State secure double the offset of the emissions it might produce before it can be permitted. Second, the State could be subjected to sanctions that could result in the loss of New Jersey's Federal transportation funds. These sanctions must be

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[7] A description of subpart 1 and subpart 2 are found in CAA Title I, part D

[8] For more information on the subpart 2 classification and requirements see "State Implementation Plans; General Preamble for the Implementation of Title I of the CAA Amendments of 1990; Proposed Rule." April 16, 1992 (57 Fed. Reg. 13498 at 13501 and 13510).

[9] The air quality design value for the 8-hour ozone NAAQS is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration. See 40 CFR part 50, Appendix I.

applied unless the deficiency is corrected within 18 months after a finding of failure or disapproval. Additionally, CAA Section 110(c) (or 42 U.S.C. §7410(c)) requires that the USEPA impose a Federal Implementation Plan (FIP) if a State fails to complete and submit a revised submission within 24 months of the failure to submit or implement a SIP.

1.2 Ozone National Ambient Air Quality Standards

1.2.1 1-Hour Ozone

In 1971, the USEPA established the first NAAQS for photochemical oxidants of 0.08 parts per million (ppm), measured as a 1-hour average concentration. In 1979, the ozone NAAQS was revised to 0.12 parts per million (ppm). The 1-hour ozone standard remained 0.12 ppm until 1997 when the USEPA replaced the 1979 standard with an 8-hour ozone standard set at 0.08 ppm.[10] The entire State of New Jersey was designated by the USEPA as nonattainment for the 1-hour ozone NAAQS and was split into four nonattainment areas. For 1-hour ozone, all of the New Jersey-associated nonattainment areas were classified under Subpart 2 of the CAA. The New Jersey counties included in each of those 1-hour nonattainment areas, as well as their classifications are shown in Table 1-1.

The USEPA revoked the 1-hour ozone standard for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (EAC) areas (which did not include any New Jersey-associated nonattainment areas) on June 15, 2005.[11] This revocation occurred prior to the attainment dates for New Jersey's two severe 1-hour ozone multi-state nonattainment areas associated with Philadelphia (2005) and New York City (2007).

1.2.2 8-Hour Ozone

1997 84 ppb 8-Hour Ozone NAAQS

In 1997, the USEPA revised the ozone NAAQS, setting it at 0.08 ppm (hereafter referred to as 84 ppb) averaged over an 8-hour time frame.[12] The USEPA set the 8-hour ozone standard based on scientific evidence demonstrating that ozone causes adverse health effects at lower ozone concentrations, over longer periods of time, than the then-existing 1-hour ozone standard.

On April 30, 2004, the USEPA finalized designations for the 1997 84 ppb 8-hour ozone NAAQS in Phase 1 of its ozone implementation rule.[13] The entire State of New Jersey was designated as nonattainment. New Jersey was designated into two multi-state nonattainment areas as follows:

(1) the New York-Northern New Jersey-Long Island nonattainment area (hereafter referred to as the Northern New Jersey-New York-Connecticut or Northern NJ-NY-CT Nonattainment Area); and
(2) the Philadelphia-Wilmington-Atlantic City nonattainment area (hereafter referred to as the Southern New Jersey-Pennsylvania-Delaware-Maryland or Southern NJ-PA-DE-MD Nonattainment Area.)

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[10] https://www.epa.gov/ground-level-ozone-pollution/timeline-ozone-national-ambient-air-quality-standards-naaqs.
[11] 40 CFR Part 81, Subpart C
[12] 62 Fed. Reg. 38856 (July 18, 1997)
[13] 69 Fed. Reg. 23858 (April 30, 2004)

Under the USEPA's Phase 1 8-hour ozone implementation rule, an area was classified under Subpart 2 based on its 8-hour design value if it had a 1-hour design value at or above 0.121 ppm (the lowest 1-hour design value in Table 1 of subpart 2). Based on this criterion, both multi-state 84 ppb 8-hour ozone nonattainment areas associated with New Jersey were classified under Subpart 2 as moderate in the April 30, 2004, rule[14], with an attainment date of June 15, 2010. The USEPA Phase 2 8-hour ozone implementation rule, published on November 9, 2005[15] (with corrections published on October 4, 2006, related to Reasonable Further Progress (RFP)[16], addressed the control obligations that apply to areas classified under Subpart 2. New Jersey's multi-state 8-hour ozone nonattainment areas for the 75 and 70 ppb standards are shown in Figure 1-1. For the 84 ppb 8-hour ozone standard Kent and Sussex counties in Delaware were also included in New Jersey's Southern NJ-PA-DE-MD Nonattainment Area. The New Jersey counties included in each of those 8-hour nonattainment areas, as well as their classifications, are shown in Table 1-1.

New Jersey submitted a SIP[17] on October 29, 2007, which presented New Jersey's plan to attain the 84 ppb 8-hour ozone standard. USEPA approved the SIP on February 11, 2013.[18]

Both of New Jersey's nonattainment areas attained the standard by the attainment date of June 15, 2010 (the southern area received a 1-year extension with a new attainment date of June 15, 2011). On June 18, 2012, the USEPA issued a clean data determination (CDD) for the 1997 84 ppb 8-hour ozone standard for the Northern NJ-NY-CT Nonattainment Area[19] and on March 26, 2012 for the Southern NJ-PA-DE-MD Nonattainment Area[20], suspending the States obligations to meet certain attainment-related planning requirements under the USEPA's Clean Data Policy dated December 14, 2004, such as reasonable available control measures (RACM), reasonable further progress, contingency measures and other planning requirements related to attainment, as long as the area continues to attain.

On May 4, 2016, the CDD for the Northern NJ-NY-CT Nonattainment Area, issued in June 2012, was rescinded.[21] USEPA determined that the area exceeded the 84 ppb standard based on 2010-2012 certified monitoring data and issued a SIP call. They required the Northern NJ-NY-CT Nonattainment Area to submit a SIP to address the 84 ppb standard exceedance either specific to the 84 ppb standard or in conjunction with the 2008 75 ppb standard attainment demonstration moderate area SIP by January 1, 2017, and set a new attainment date of July 20, 2018.

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[14] 69 Fed. Reg. 23858 (April 30, 2004)
[15] 70 Fed. Reg. 71612 (November 29, 2005)
[16] 71 Fed. Reg. 58498 (October 4, 2006)
[17] State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard 8-Hour Ozone Attainment Demonstration, The State of New Jersey Department of Environmental Protection, October 29, 2007
[18] 78 Fed. Reg. 9596 (February 11, 2013)
[19] 77 Fed. Reg. 36163 (June 18, 2012
[20] 77 Fed. Reg. 17341 (March 26, 2012)
[21] 81 Fed. Reg. 26697 (May 4, 2016)

On December 22, 2017, New Jersey submitted a SIP revision[22] showing that the Northern NJ-NY-CT Nonattainment Area is in compliance with the 1997 84 ppb 8-hour ozone NAAQS and satisfying the May 4, 2016, SIP Call. USEPA approved the SIP on September 2, 2021.[23]

2008 75 ppb 8-Hour Ozone NAAQS

The USEPA revised the 8-hour ozone NAAQS again on March 12, 2008.[24] The 8-hour ozone standard was lowered from 84 ppb to 0.075 ppm (75 ppb). The USEPA announced on September 16, 2009, that the 0.075 ppm standard was being reconsidered, and the designations were stayed (put on hold).

On January 19, 2010, the USEPA proposed to strengthen the 8-hour ozone NAAQS set in March 2008 to a level within the range of 0.060 – 0.070 ppm. [25] In September of 2011, the USEPA announced that it would not adopt its proposed ozone NAAQS and would instead proceed with the implementation of the 2008 0.075 ppm 8-hour ozone standard.

On May 21, 2012, the USEPA designated the entire State of New Jersey as nonattainment for the 75 ppb 8-hour ozone NAAQS. [26] The nonattainment areas are the same as those designated for the 84 ppb standard. The final classifications rule for the 2008 NAAQS was signed and published at the same time as the designation rule.[27] In the May 21, 2012, classification rule, both of New Jersey's multi-state nonattainment areas were classified as marginal with an attainment date of July 20, 2015. New Jersey's multi-state 8-hour ozone nonattainment areas for the 75 ppb and 70 ppb standards are shown in Figure 1-1. The New Jersey counties included in each of those 8-hour nonattainment areas, as well as their classifications, are shown in Table 1-1.

On June 17, 2015, New Jersey sent a letter to the USEPA requesting a 1-year extension of the attainment date to July 20, 2016, for the Southern NJ-PA-DE-MD Nonattainment Area. On May 4, 2016[28], the USEPA granted the Southern NJ-PA-DE-MD Nonattainment Area a 1-year attainment date extension to July 20, 2016.

On March 6, 2015, USEPA promulgated the Ozone Implementation Rule or SIP requirements rule for the 75 ppb 8-hour ozone NAAQS, which specifies the detailed requirements for State Implementation Plans. [29]

On May 4, 2016, USEPA reclassified the Northern NJ-NY-CT Nonattainment Area from marginal to moderate because they determined that the area did not attain the 2008 75 ppb ozone standards by the July 20, 2015.[30] They required the Northern NJ-NY-CT Nonattainment

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[22] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard,1997 84 ppb and 2008 75 ppb 8-Hour Ozone Attainment Demonstration Northern New Jersey-New York-Connecticut Nonattainment Area and Nonattainment New Source Review (NNSR) Program Compliance Certification New Jersey Statewide, December 22, 2017.
[23] 86 Fed. Reg. 49249 (September 2, 2021)
[24] 73 Fed. Reg. 16483 (March 27, 2008)
[25] 75 Fed. Reg. 2938 (January 19, 2010)
[26] 77 Fed. Reg. 30088 (May 21, 2012)
[27] 77 Fed. Reg. 30160 (May 21, 2012)
[28] 81 Fed. Reg. 26697 (May 4, 2016)
[29] 80 Fed. Reg. 12264 (March 6, 2015)
[30] 81 Fed. Reg. 26697 (May 4, 2016)

Area to submit a SIP to address the moderate nonattainment area requirements and set a new attainment date of July 20, 2018.

On April 18, 2017, USEPA proposed that the Southern NJ-PA-DE-MD Nonattainment Area attained the 2008 75 ppb 8-hour ozone NAAQS by the July 20, 2016, attainment date based on complete, certified, and quality assured ambient air quality monitoring data for the 2013–2015 monitoring period. [31] USEPA finalized the determination on November 2, 2017.[32]

On September 23, 2019, USEPA reclassified the Northern NJ-NY-CT Nonattainment Area from moderate to serious because they determined that the area did not attain the 2008 75 ppb ozone standards by the July 20, 2018 attainment date. [33] They required the Northern NJ-NY-CT Nonattainment Area to submit a SIP to address the serious nonattainment area requirements by August 3, 2020 and set a new attainment date of July 20, 2021.

On November 18, 2021, New Jersey submitted an attainment demonstration for the moderate Northern NJ-NY-CT Nonattainment Area for the 2008 75 ppb ozone standard.[34]

On October 7, 2022, USEPA reclassified the Northern NJ-NY-CT Nonattainment Area from serious to severe because they determined that the area did not attain the 2008 75 ppb ozone standards by the July 20, 2021, attainment date. [35] They required the Northern NJ-NY-CT Nonattainment Area to submit a SIP to address the severe nonattainment area requirements and set a new attainment date of July 20, 2027.

2015 70 ppb 8-Hour Ozone NAAQS

The USEPA revised the 8-hour ozone NAAQS again on October 1, 2015.[36] The primary 8-hour ozone standard was lowered from 75 ppb to 0.70 ppm (70 ppb). On June 4, 2018, USEPA designated the entire State of New Jersey as nonattainment for the 2015 70 ppb ozone standards. The nonattainment areas are the same as those designated for the 84 ppb standard and the 75 ppb standard. The final classification rule for the 2015 NAAQS was signed and published at the same time as the designation rule.[37]

In the June 4, 2018, classification rule, the Northern NJ-NY-CT Nonattainment Area was classified as moderate with an attainment date of August 3, 2024, and the Southern NJ-PA-DE-MD Nonattainment Area was classified as marginal with an attainment date of August 3, 2021.

On October 7, 2022, USEPA reclassified the Southern NJ-PA-DE-MD Nonattainment Area from marginal to moderate because they determined that the area did not attain the 2015 70 ppb ozone standards by the August 3, 2021, attainment date.[38] They required the Southern NJ-PA-

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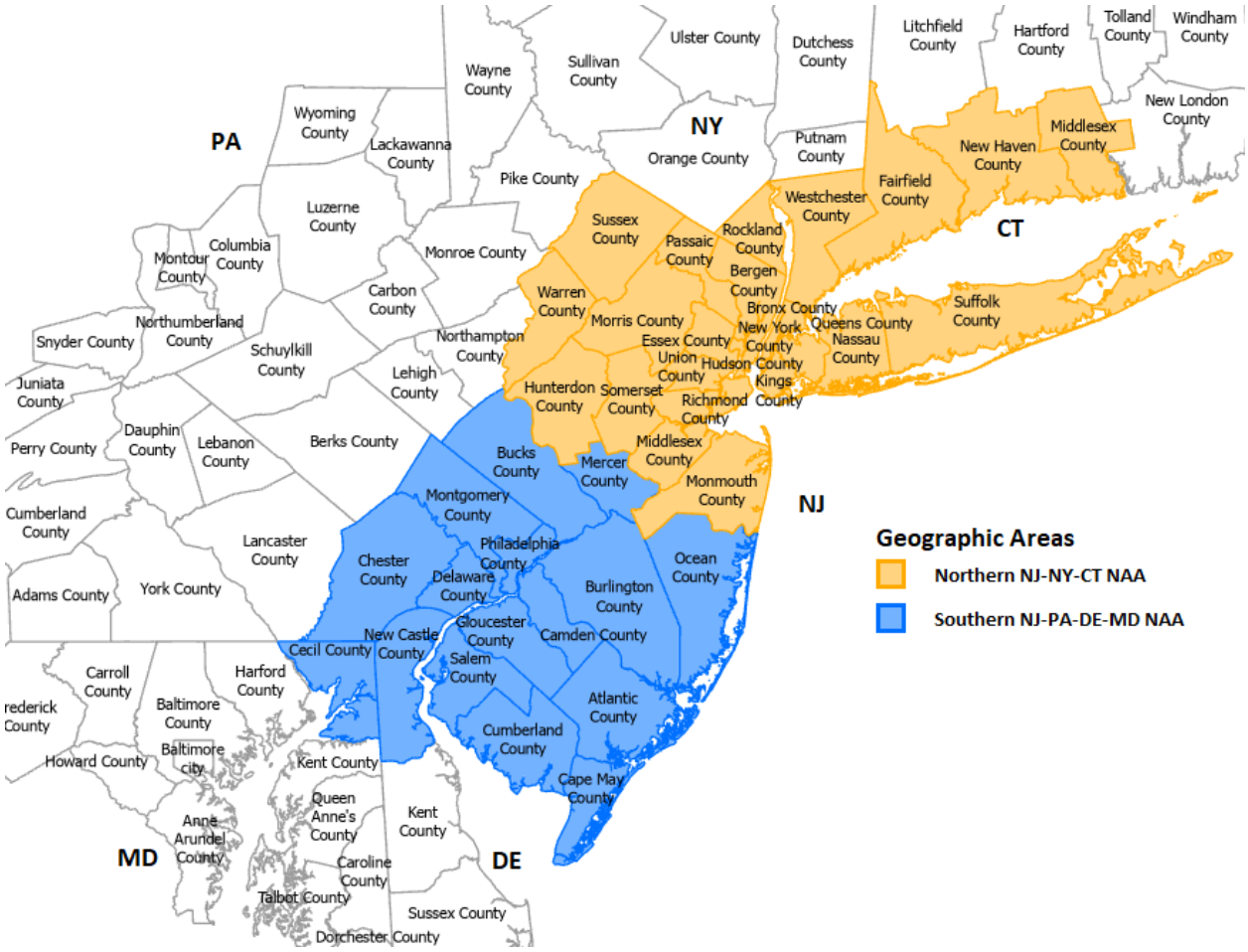
[31] 82 Fed. Reg. 18268 (April 18, 2017)
[32] 82 Fed. Reg. 50814 (November 2, 2017)
[33] 84 Fed. Reg. 44251 (August 23, 2019)
[34] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, 2008 75 ppb 8-Hour Ozone Attainment Demonstration, Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications, and 2017 Periodic Emissions Inventory, November 18, 2021.
[35] 87 Fed. Reg. 60926 (October 7, 2022)
[36] 80 Fed. Reg. 65292 (October 26, 2015)
[37] 83 Fed. Reg. 25819 (June 4, 2018)
[38] 87 Fed. Reg. 60897 (October 7, 2022)

DE-MD Nonattainment Area to submit a SIP to address the moderate nonattainment area requirements and set a new attainment date of August 3, 2024.

This SIP satisfies the SIP submittal requirements of the June 4, 2018, classification rule for New Jersey's Northern NJ-NY-CT Nonattainment Area moderate classification and the October 7, 2022, reclassification of New Jersey's Southern NJ-PA-DE-MD Nonattainment Area from marginal to moderate for the 2015 70 ppb 8-hour ozone NAAQS.

New Jersey's multi-state 8-hour ozone nonattainment areas for the 75 ppb and 70 ppb standards are shown in Figure 1-1. The New Jersey counties included in each of those 8-hour nonattainment areas, as well as their classifications, are shown in Table 1-1.

Figure 1-1: New Jersey 8-hour Ozone Nonattainment Areas
75 and 70 ppb NAAQS



* **Note:** Kent and Sussex counties in DE are included in the Southern NJ-PA-DE-MD Nonattainment Area for the 84 ppb 8-hour ozone NAAQS.

Table 1-1: New Jersey Associated Ozone Nonattainment Areas, Designations and Classifications

Area Name	New Jersey 1-Hour Designations	New Jersey 1-Hour Classifications	New Jersey 84 ppb 8-hour Designations	New Jersey 84 ppb 8-Hour Classifications	New Jersey 75 ppb 8-Hour Designations	New Jersey 75 ppb 8-Hour Classifications	New Jersey 70 ppb 8-Hour Designations	New Jersey 70 ppb 8-Hour Classifications
Northern New Jersey-New York-Connecticut, NJ-NY-CT	Bergen Essex Hudson Hunterdon Middlesex Monmouth Morris Ocean Passaic Somerset Sussex Union	Severe 17	Bergen Essex Hudson Hunterdon Middlesex Monmouth Morris Passaic Somerset Sussex Union Warren	Moderate (69 FR 23858 April 30, 2004)	Bergen Essex Hudson Hunterdon Middlesex Monmouth Morris Passaic Somerset Sussex Union Warren	Marginal (77 FR 30135 May 21, 2012) Reclassified to Moderate (81 FR 26719 May 4, 2016) Reclassified to Serious (84 FR 44251 August 23, 2019) Reclassified to Severe (87 FR 60926 October 7, 2022)	Bergen Essex Hudson Hunterdon Middlesex Monmouth Morris Passaic Somerset Sussex Union Warren	Moderate (83 FR 25819 June 4, 2018)
Southern New Jersey-Pennsylvania-Delaware-Maryland, NJ-PA-DE-MD	Burlington Camden Cumberland Gloucester Mercer Salem	Severe 15	Atlantic Burlington Camden Cape May Cumberland Gloucester Ocean Mercer Salem	Moderate (69 FR 23858 April 30, 2004)	Atlantic Burlington Camden Cape May Cumberland Gloucester Ocean Mercer Salem	Marginal (77 FR 30135 May 21, 2012)(3)	Atlantic Burlington Camden Cape May Cumberland Gloucester Ocean Mercer Salem	Marginal (83 FR 25819 June 4, 2018) Reclassified to Moderate (87 FR 60897 October 7, 2022)
Allentown-Bethlehem-Easton, PA-NJ	Warren	Marginal	(1)	(1)	(1)	(1)	(1)	(1)
Atlantic City, NJ	Atlantic Cape May	Moderate	(2)	(2)	(2)	(2)	(2)	(2)

Notes:

1. Included in the Northern New Jersey-New York-Connecticut nonattainment area
2. Included in the Southern New Jersey-Pennsylvania-Delaware-Maryland nonattainment area
3. Attainment date was extended to July 20, 2016.

1.3 Health Effects and Welfare Impacts

1.3.1 Ozone

Ozone continues to be New Jersey's most pervasive air quality problem. Although the ozone found in the earth's upper atmosphere (stratosphere) forms a protective layer from the sun's ultraviolet radiation, the ozone formed near the earth's surface (troposphere) is inhaled by or comes in contact with people, animals, crops and other vegetation, and can cause a variety of health and other effects. Ozone is a highly reactive gas. In the troposphere, it is formed by complex chemical reactions involving nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight.

Ozone causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Ozone has long been known to increase the incidence of asthma attacks in susceptible individuals. Ozone exposure also makes the lungs more vulnerable to lung diseases such as pneumonia and bronchitis. Ozone not only affects people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to ozone for several hours at relatively low concentrations significantly reduces lung function and induces respiratory inflammation in normal, healthy people during exercise. This decrease in lung function is generally accompanied by symptoms such as chest pain, coughing, sneezing, and pulmonary congestion. Recent research in southern California strongly suggests that, in addition to exacerbating existing asthma, ozone also causes asthma in children.[39] Longer-term exposure to ozone can also lead to scarring of the lung tissue and permanent reductions in lung capacity.[40] Long-term exposure to ozone can eventually lead to premature death.[41]

Besides its impact on human health, ozone also has environmental impacts. Specifically, ozone interferes with the ability of plants to produce and store food, which makes them more susceptible to disease, insects, other pollutants, and harsh weather. Ozone damages the leaves of trees and other plants, ruining the appearance of cities, national parks, and recreation areas. Ozone reduces crop and forest yields and increases plant vulnerability to disease, pests, and harsh weather. This impacts annual crop production throughout the United States, resulting in significant losses, and injures native vegetation and ecosystems. Ozone also damages certain man-made materials, such as textiles, fibers, dyes, and paints, requiring more frequent upkeep and repair.

1.3.2 Ozone Precursor – Nitrogen Oxides (NO_x)

Nitrogen oxides consist of a mixture of gases comprised mostly of nitric oxide (NO) and nitrogen dioxide (NO_2). Although most NO_x is emitted as NO, it is readily converted to NO_2 in the atmosphere. NO_2 is a reddish-brown highly reactive gas that is formed in the air through the oxidation of NO. In the troposphere, near the Earth's surface, NO_2, not molecular oxygen, provides the primary source of the oxygen atoms required for ozone formation. These gases

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[39] MARAMA Appendix A: Health Effects of Air Pollutants, A Guide to Mid-Atlantic Regional Air Quality Report. Mid-Atlantic Regional Air Management Association (MARAMA), October 2005, p. 89.
[40] NJDEP Reasonably Available Control Technology (RACT) for the 8-Hour Ozone NAAQS (NAAQS) and other Associated State Implementation Plan (SIP) Revisions for the Fine Particulate Matter NAAQS, Regional Haze, and the CAA Requirements on Transport of Air Pollution. New Jersey Department of Environmental Protection, August 1, 2007.
[41] USEPA Air Quality Criteria for Ozone and Related Photochemical Oxidants, Volume I of III. United States Environmental Protection Agency, February 2006.

are emitted from a variety of sources such as the exhaust of motor vehicles, boats, planes and locomotives, the burning of coal, oil or natural gas, residential wood burning, forest fires, manufacturing and industrial processes.

In addition to contributing to the formation of ozone, NO_x is also harmful if directly inhaled. Short-term exposures to low levels of nitrogen dioxide may aggravate pre-existing respiratory illnesses, and can cause respiratory illnesses, particularly in children ages 5-12. Symptoms of low-level exposure to NO and NO_2 include irritation to eyes, nose, throat and lungs, coughing, shortness of breath, tiredness and nausea. Long-term exposures to NO_2 may increase susceptibility to respiratory infection and may cause permanent damage to the lung. Studies show a connection between breathing elevated short-term NO_2 concentrations and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma. Individuals who spend time on or near major roadways can experience high, short-term NO_2 exposures. Nitrogen oxides contribute to a wide range of environmental problems. These include potential changes in the composition of some plants in wetland and terrestrial ecosystems, acidification of freshwater bodies, eutrophication of estuarine and coastal waters, increases in levels of toxins harmful to fish and other aquatic life, and visibility impairment.[42]

1.3.3 Ozone Precursor – Volatile Organic Compounds (VOCs)

VOCs are organic chemicals that have a high vapor pressure at ordinary room temperature. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air, a trait known as volatility. The term volatile in VOCs indicates that the compounds evaporate easily at room temperature and organic indicates that they contain carbon. They include compounds known as hydrocarbons, which only contain carbon and hydrogen, and carbonyls, which contain a carbon atom double-bonded to an oxygen atom. Some VOCs are more harmful than others and are considered hazardous air pollutants, toxics or carcinogens (cancer causing). The USEPA and New Jersey regulatory definition of VOC, as it relates to ozone, exempts certain VOCs due to their low reactivity with sunlight to form ozone.[43]

VOCs are emitted from a wide variety of sources such as manufacturing processes, gasoline stations, autobody repair shops, motor vehicles, recreational boating, lawn and garden equipment and consumer product use including household cleaners, paints, cosmetic and hair products, cleaning solvents, adhesives and insecticides. Sources of VOCs also include natural biogenic emissions.

In sufficient quantities, VOCs can cause eye, nose, and throat irritations, headaches, dizziness, visual disorders, memory impairment; some are known to cause cancer in animals; some are suspected of causing, or are known to cause, cancer in humans. (See USEPA Volatile Organic Compounds' Impact on Indoor Air Quality https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality.) In addition, several VOCs are also hazardous air pollutants (HAPs).[44] HAPs are substances that could cause serious health effects, including cancer, birth defects, nervous system problems and death due to massive accidental releases. (See USEPA Hazardous Air Pollutants at: https://www.epa.gov/haps .)

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[42] Ibid.
[43] USEPA's ozone air quality definition of volatile organic compounds is defined at 40 CFR 51.100(s). New Jersey's ozone air quality rules reference USEPA's definition.
[44] Substances listed in 1990 CAA Title I, Section 112(b).

1.4 Environmental Justice

New Jersey has been addressing the needs of environmental justice (EJ) communities since 1998, including assisting in the creation of the Environmental Equity Task Force, which eventually became the Environmental Justice Advisory Council (EJAC). These groups hold regular meetings that include environmental justice advocates and the New Jersey Department of Environmental Protection (NJDEP) to discuss and address issues of concern. New Jersey has implemented numerous initiatives, collaborations, Administrative Orders and Executive Orders to address the needs and concerns of overburdened communities.

A general timeline of key environmental justice milestones implemented by New Jersey include the following:

- 1998: NJDEP Commissioner Shinn creates an Environmental Equity Task Force that later becomes the Environmental Justice Advisory Council (EJAC).
- 2003: NJDEP Commissioner Campbell formalizes the Environmental Justice (EJ) Program to focus on identifying key EJ and establishing program information.
- 2004: Governor McGreevey issues New Jersey's first Environmental Justice Executive Order No. 96.
- 2009: Governor Corzine issues Environmental Justice Executive Order No. 131.
- 2016: NJDEP Commissioner Martin issues Environmental Justice Administrative Order 2016-08.
- 2017: U.S. Senator for New Jersey Cory Booker introduces first federal Environmental Justice bill.
- 2018: Governor Murphy issues Environmental Justice Executive Order No.23.
- 2020: New Jersey's Environmental Justice Law (N.J.S.A. 13:1D-1 et seq.) is enacted on September 18, 2020.
- 2023: Regulations for implementing NJDEP's Environmental Justice Rules at N.J.A.C. 7:1C go into effect on April 17, 2023.

New Jersey's Environmental Justice Law (N.J.S.A. 13:1D-1 et seq.) enacted on September 18, 2020, requires the NJDEP to evaluate the environmental and public health impacts of certain facilities on overburdened communities when reviewing certain permit applications, and to adopt regulations to implement the provisions of the act. For certain facility types, the law requires an Environmental Impact Assessment to be prepared by the applicant. In addition, facilities will be required to hold their own public hearing prior to, and independent of, any hearing required by other regulations.

The regulations for implementing NJDEP's Environmental Justice Rules at N.J.A.C. 7:1C that went into effect on April 17, 2023, clarify more specifically when and how a neighborhood is deemed to be an EJ area, provide more specifics on which facilities are covered, and the additional requirements that would be imposed on covered facilities in EJ areas.

In addition, NJDEP also created the "What's In My Community" (WIMC) tool, a GIS-mapping web application that allows a user to see the air permits issued in their community. The tool also identifies overburdened communities, schools, hospitals, and emergency services (Police and Fire departments). The public users can also see measurements from air monitors and generate a report. WIMC can be accessed at the following link: https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=76194937cbbe46b1ab9a9ec37c7d709b.

Chapter 2 AIR MONITORING

2.1 Introduction

This chapter provides a summary of ozone air quality monitoring in New Jersey and its two multi-state ozone nonattainment areas. The data summarized includes current and historical 8-hour ozone design values, monitor exceedances, ozone precursor concentrations, and meteorology.

Eight-hour average ozone concentrations in New Jersey have been calculated since 1986, prior to the 8-hour ozone standard implementation in 1997 and before designations were made in 2004. Data for 8-hour ozone before 1997 are used for analysis purposes only and do not represent official reporting for the 8-hour ozone NAAQS.

2.2 8-Hour Ozone

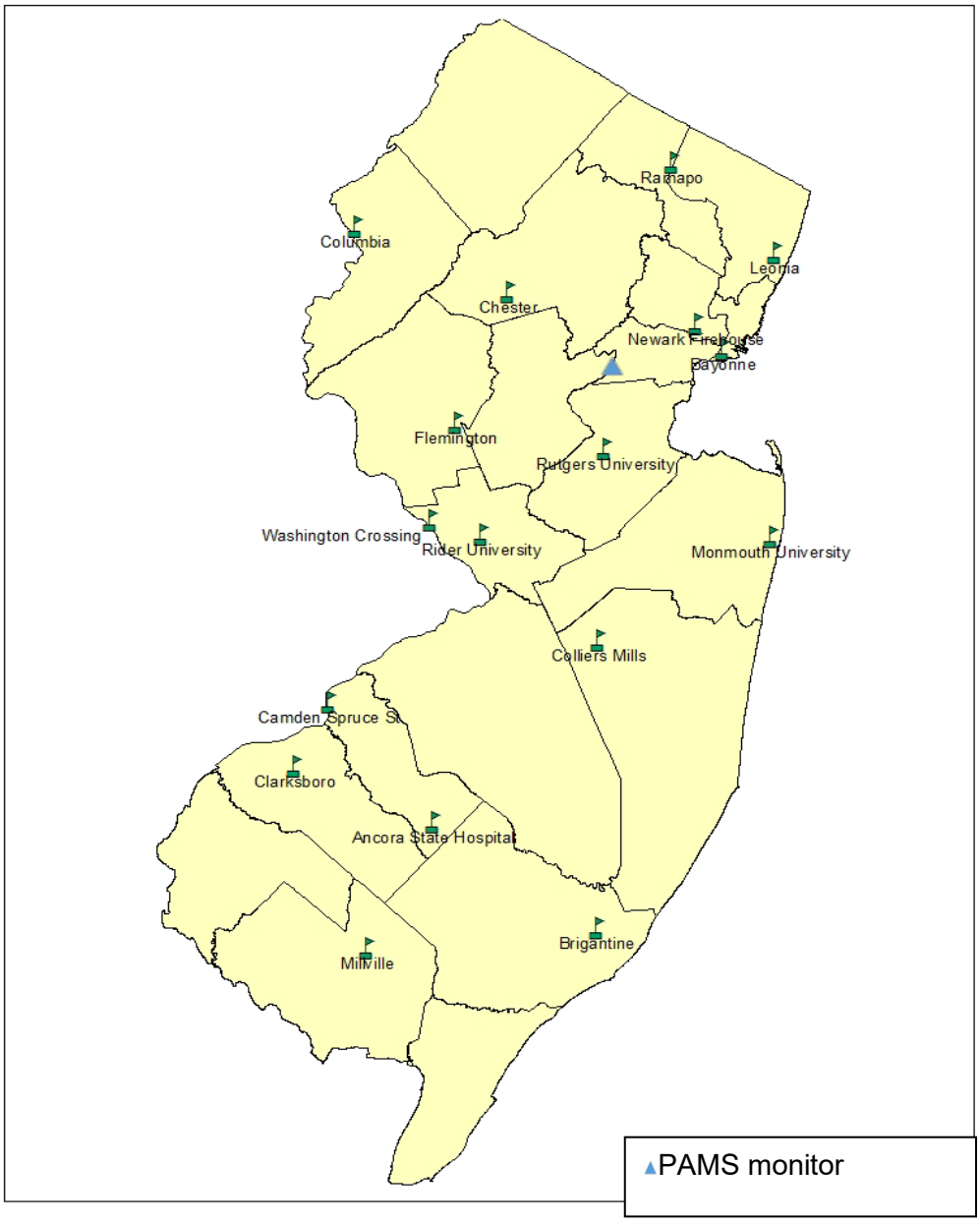
To determine compliance with the NAAQS for ozone, the USEPA established criteria for measuring and reporting ambient air concentrations of ozone at 40 CFR 58. In accordance with 40 CFR 50, data collected from air quality monitors with Federal Reference Method (FRM), or Federal Equivalent Method (FEM) designation are used by New Jersey to calculate design values (DV) at each site to determine compliance with the ozone NAAQS. Ozone design values are defined as the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration measured at any site within an area (multi-state for New Jersey). An area's design value must not exceed the standard to show compliance. The design value for a nonattainment area is the maximum monitor design value for all monitors for each 3-year period. Maximum design values are not necessarily measured at the same site from year to year.

The NJDEP currently measures ozone concentrations at 16 sites in New Jersey. Seventeen sites were running prior to September 2022. The Newark Firehouse site was closed in September 2022 and NJDEP is currently working on re-establishing a new monitor in Newark City. Eleven of the sites have been collecting data continuously for at least 15 years. The Washington Crossing site is a USEPA Clean Air Status and Trends Network (CASTNET) monitor, which is not run by NJDEP, but the data is included in the Southern NJ-PA-DE-MD Nonattainment Area. Previously, the ozone monitoring season in New Jersey ran from April to October. When the 2015 ozone NAAQS was finalized on October 26, 2015, the ozone monitoring season in New Jersey was changed to run from March 1 to October 31, effective December 28, 2015.

Ozone monitoring site locations in New Jersey are shown in Figure 2-1. Figure 2-1 also identifies monitors for ozone precursors as part of the Photochemical Assessment Monitoring Station (PAMS) program, which is discussed further is Section 2.3.

As discussed in Chapter 1, New Jersey is part of two multi-state ozone nonattainment areas. In the multi-state 8-hour ozone Northern NJ-NY-CT Nonattainment Area, there are currently 27 ozone monitors. Nine of these monitors operate in the 12 county New Jersey portion of Northern NJ-NY-CT Nonattainment Area. In the multi-state 8-hour ozone Southern NJ-PA-DE-MD Nonattainment area, there are currently 23 ozone monitors. Eight of these monitors operate in the nine county New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area. For more details regarding New Jersey's air quality monitoring network, see the NJDEP 2022 annual report at https://www.nj.gov/dep/airmon/ under Data.

Figure 2-1: New Jersey Ozone FRM Monitoring Network



2.2.1 8-Hour Ozone Design Values

The 8-hour ozone design values for 2022 in the Northern NJ-NY-CT Nonattainment Area are shown in Figure 2-2. The monitor with the highest 2022 design value of 81 ppb is at Stratford in Connecticut followed by 80 ppb at Westport (Sherwood Island Connector) in Connecticut. The 8-hour ozone design values for 2022 in the Southern NJ-PA-DE-MD Nonattainment Area are shown in Figure 2-3. The monitor with the highest and only exceeding 2022 design value of 72 ppb is the Bucks (Bristol) monitor in Pennsylvania.

Design values for 2023 have been included in the table in Appendix 2-1. New Jersey's design values were certified early, on December 18, 2023, before the May 1 annual deadline for certifying the data in USEPA's AQS database. The 2023 design values for the other states in New Jersey's nonattainment areas, Connecticut, Delaware, Maryland, New York, and Pennsylvania, are "preliminary" because the individual states have not yet certified their data. Once the preliminary data is certified, it is available from the USEPA.

As of December 18, 2023, preliminary monitoring data for the Northern NJ-NY-CT nonattainment area for the 2023 ozone season indicates that the highest design values continue to be the four monitors on the north side of the Long Island Sound in Connecticut. The data shows 82 ppb at Westport, 82 ppb at Stratford, 79 ppb at Madison, and 79 ppb at Greenwich. The highest design value for the Southern NJ-PA-DE-MD nonattainment area is 73 ppb at the Bucks (Bristol) monitor in PA. However please note, the preliminary 2023 data for the nonattainment areas includes pollution influences from exceptional events due to significant wildfires in Canada, which will be discussed in more detail below in Section 2.5. Preliminary 2023 design values that exclude certain exceptional events only in the New Jersey portion of New Jersey's southern nonattainment area have also been included in the table in Appendix 2-1.

The 2023 certified monitoring data for New Jersey with the exceptional events included shows that all of the New Jersey monitors are below the 70 ppb standard, with the exception of Rutgers at 71 ppb, which was most likely influenced by the significant wildfires.

Figure 2-2: 8-hour Ozone Design Values 2022
Northern NJ-NY-CT Nonattainment Area

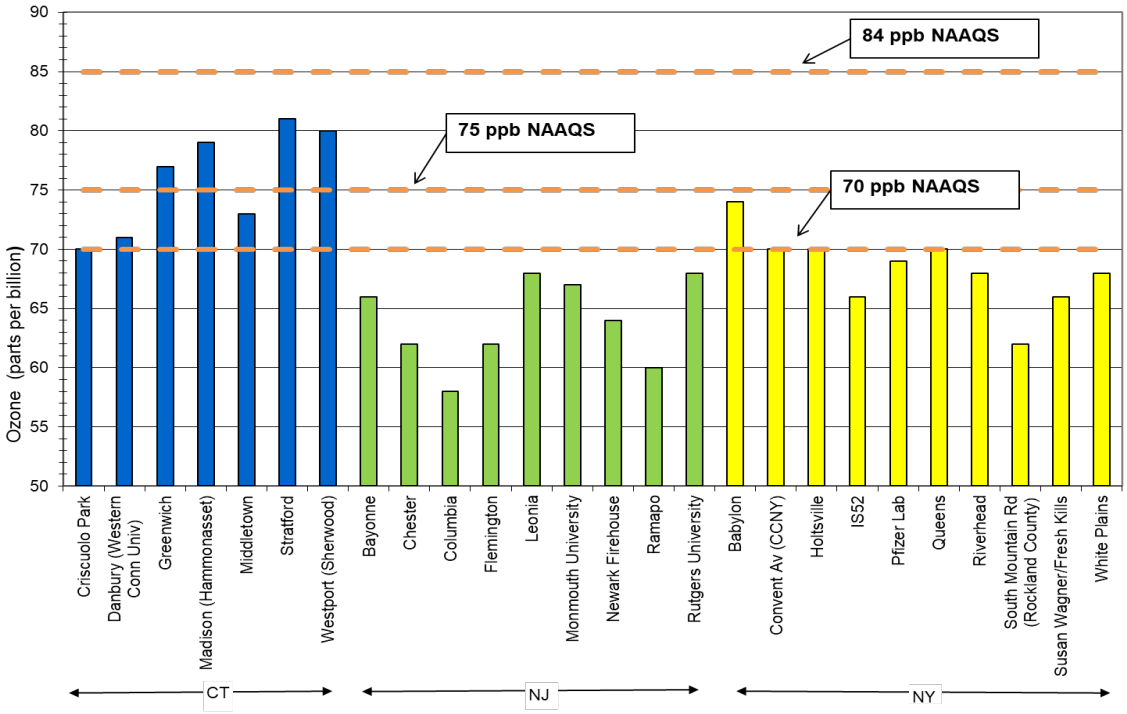
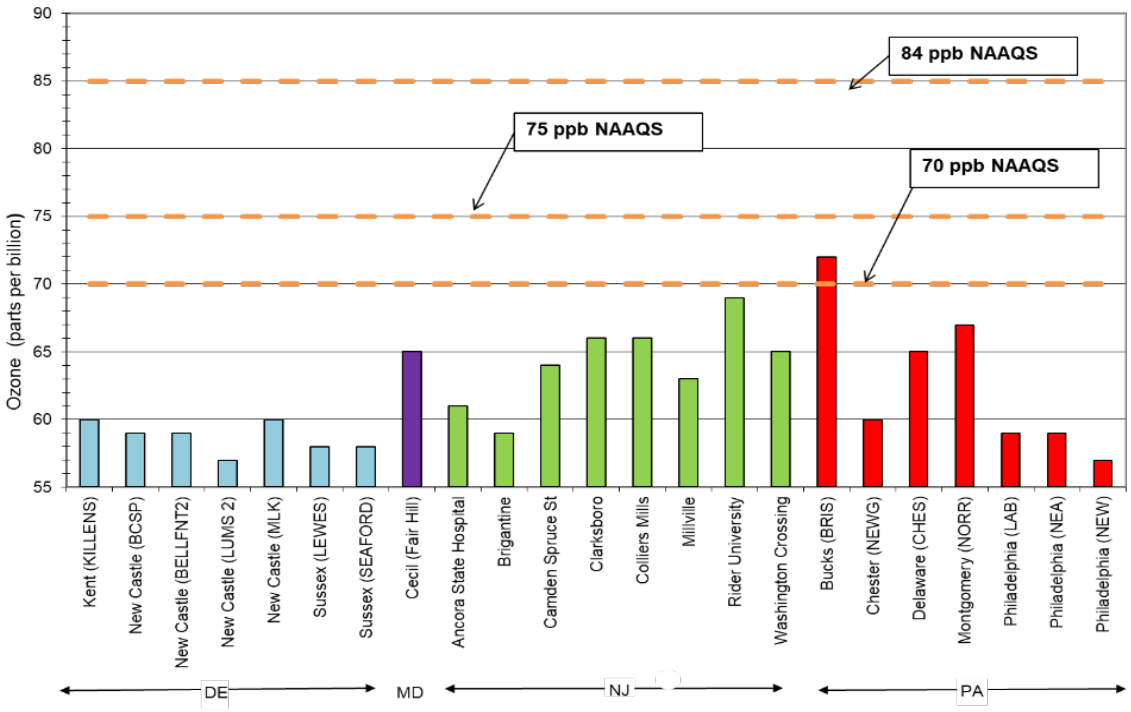


Figure 2-3: 8-hour Ozone Design Values 2022
Southern NJ-PA-DE-MD Nonattainment Area



2.2.2 8-Hour Ozone Design Value Historical Trends

Historical trends of New Jersey's statewide 8-hour ozone design values, New Jersey's multi-state Northern NJ-NY-CT Nonattainment Area, and New Jersey's multi-state Southern NJ-PA-DE-MD Nonattainment Area design values are shown in Figures 2-4, 2-5, and 2-6, respectively. Historical ozone design values and more recent annual fourth highs for New Jersey and its multi-state nonattainment areas are included in Appendix 2-1.

As shown in Figure 2-4, statewide 8-hour ozone maximum design values in New Jersey have decreased approximately 48 percent from 1988-2022. All-time low design values of 68 ppb were calculated in 2022 in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area and 69 ppb in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area.

Figure 2-5 shows that the maximum 8-hour ozone design values in the Northern NJ-NY-CT Nonattainment Area have decreased approximately 24 percent from 1999-2022. The maximum design values for the nonattainment area show a slight decreasing trend of approximately 5 percent from 2014 to 2022. However, the maximum design values in the New Jersey portion of the northern area from 2014 to 2022 show a decreasing trend of approximately 8 percent.

Figure 2-6 shows that the maximum 8-hour ozone design values in the Southern NJ-PA-DE-MD Nonattainment Area have decreased approximately 35 percent from 1999-2022. The design values for the southern area increased from 72 ppb to 73 ppb from 2022 to preliminary 2023, with the exceptional events included in 2023. The maximum design values for the nonattainment area show a decreasing trend of approximately 6 percent from 2014 to 2022 and 5 percent from 2014 to preliminary 2023. However, the maximum design values in the New Jersey portion of the southern area from 2014 to 2022 show a decreasing trend of approximately 9 percent. The annual 4th high ozone concentration in the area reached an all-time low in 2022 of 70ppb. The annual 4th high was 74 ppb in preliminary 2023 with exceptional events included.

Figure 2-4: 8-Hour Ozone Design Values 1988-2022
New Jersey Statewide

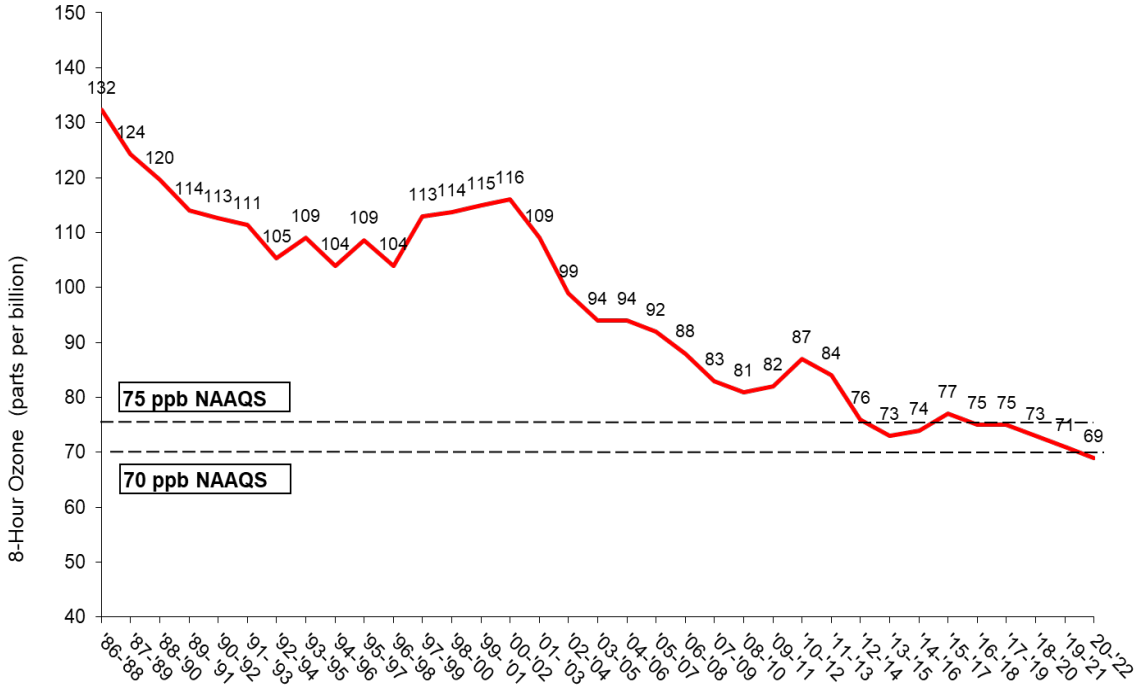


Figure 2-5: 8-Hour Ozone Design Values 1999-2022
Northern NJ-NY-CT Nonattainment Area

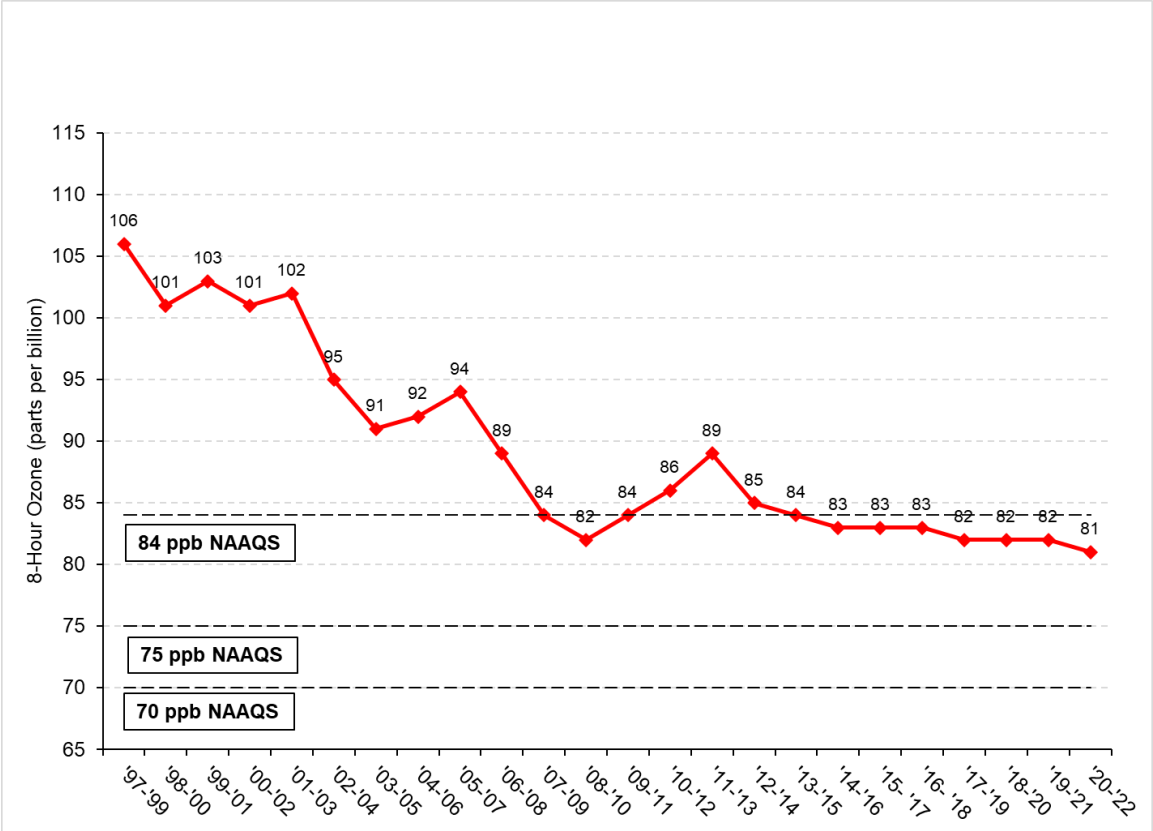
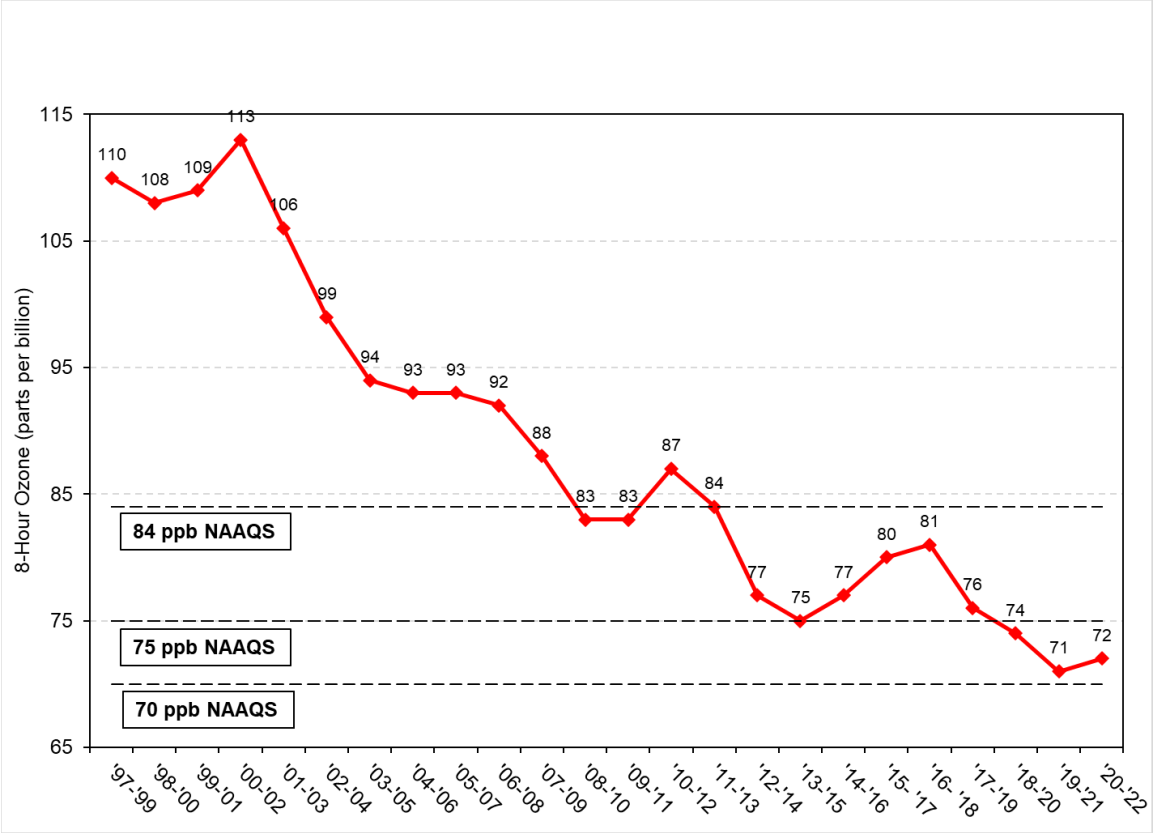
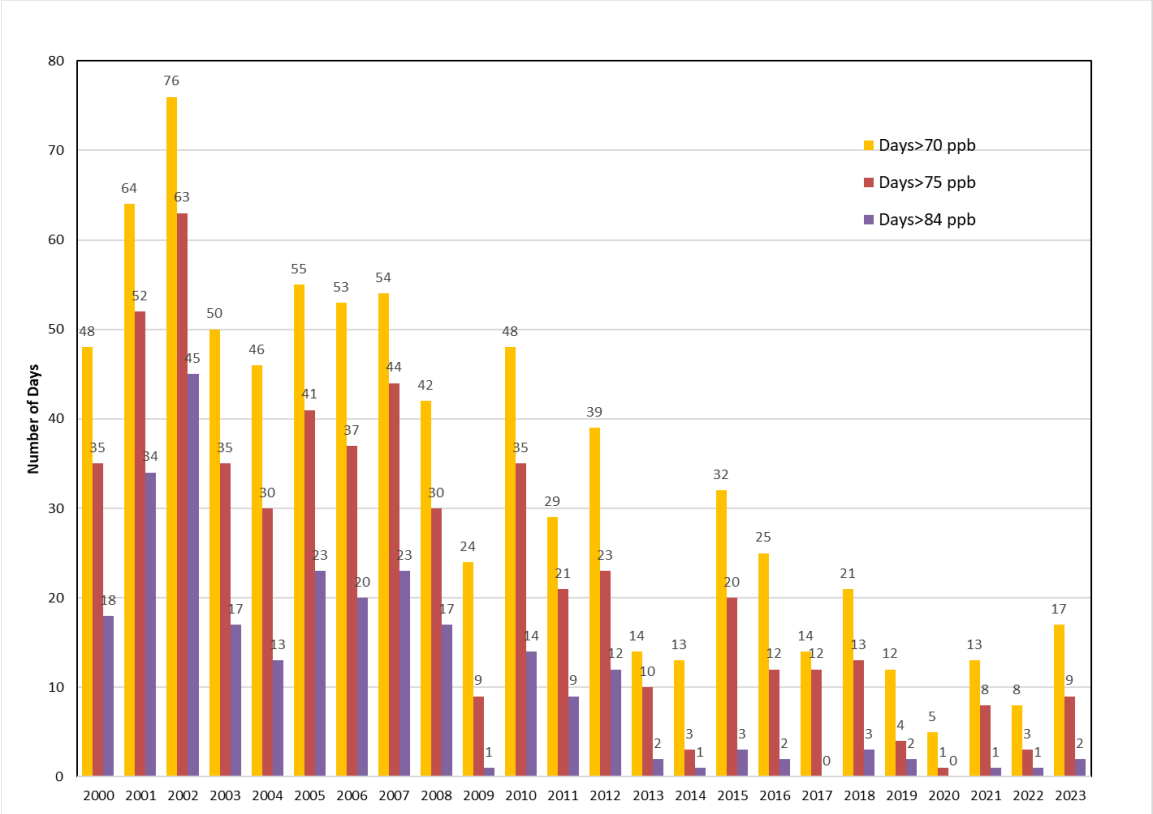


Figure 2-6: 8-Hour Ozone Design Values 1999-2022
Southern NJ-PA-DE-MD Nonattainment Area



One way to measure improvement in ozone air quality is by looking at the number of days that ozone is above the NAAQS across the State. Monitored exceedances occur when an 8-hour average ozone concentration is greater than the standard. A historical trend of the number of days the 8-hour ozone concentrations exceeded the 70 ppb, 75 ppb, and 84 ppb ozone standards is shown in Figure 2-7. The total number of monitored exceedances of the 8-hour ozone standards has decreased significantly in New Jersey from 2000 to 2023. The trend shows an increase in 2023 due to the significant wildfires.

Figure 2-7: Number of Days the 8-Hour Ozone Standard was Exceeded 2000-2023 New Jersey Statewide



Note: 2023 values include exceptional events

2.3 Ozone Precursor Concentrations

Ozone is formed when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) react in the presence of sunlight. This section summarizes the monitoring trends for these ozone precursors.

In 1993, Federal revisions to air monitoring regulations required states to enhance monitoring for ozone and its precursors.[45] In accordance with these regulations, New Jersey recommended monitoring for ozone precursors at three locations through the Photochemical Assessment Monitoring Station (PAMS) program as part of New Jersey's Ambient Air Monitoring Network: Rider University (1995-2010), Rutgers University (1996-present) and Camden (1997-2008). Currently, only the Rutgers University PAMs site is operating, in accordance with the most current requirements. The Rutgers University monitor is both a Type 1 upwind/background site PAMS monitor for the New York City Metropolitan Statistical Area (MSA) and a Type 4 extreme downwind site PAMS monitor for the Philadelphia MSA. Measurements recorded by PAMS include ozone, individual VOCs (including several carbonyls), NO_x, nitric oxide (NO), nitrogen dioxide (NO_2), and some meteorological parameters. The objectives of the PAMS program include providing a speciated ambient air database that is both representative of and useful for ascertaining ambient profiles and distinguishing among various individual VOCs and that is characteristic of source emissions impacts. In addition,

[45] 58 Fed. Reg. 8452 (February 12, 1993).

PAMS sites contribute to a better understanding of the ozone problem in metropolitan areas while taking into account meteorological and transport factors.

2.3.1 Volatile Organic Compounds (VOCs)

VOCs are organic chemicals that have a high vapor pressure at ordinary room temperature. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air, a trait known as volatility. The term volatile in VOCs indicates that the compounds evaporate easily at room temperature and organic indicates that they contain carbon. They include compounds known as hydrocarbons, which only contain carbon and hydrogen, and carbonyls, which contain a carbon atom double-bonded to an oxygen atom. Some VOCs are more harmful than others and are considered hazardous air pollutants, toxics or carcinogens (cancer causing). The USEPA and New Jersey regulatory definition of VOC, as it relates to ozone, exempts certain VOCs due to their low reactivity with sunlight to form ozone.[46]

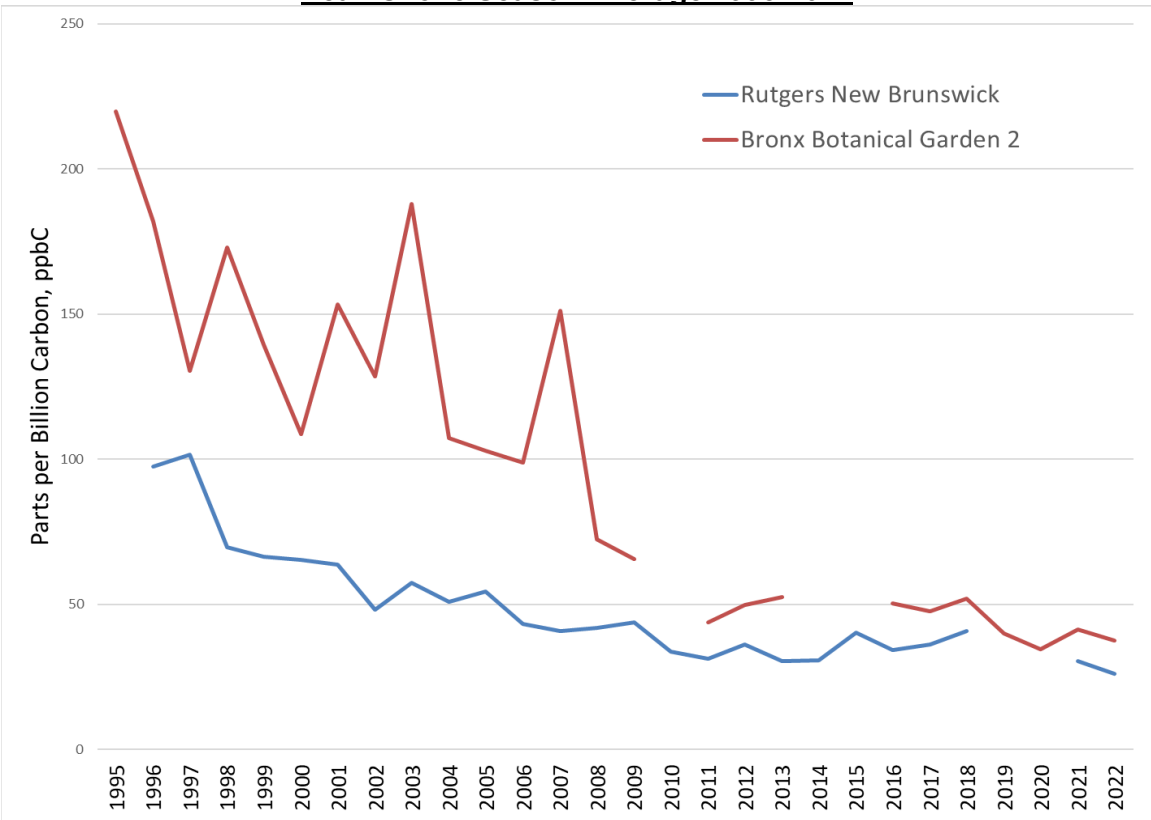
VOCs are emitted from a wide variety of sources such as manufacturing processes, gasoline stations, autobody repair shops, motor vehicles, recreational boating, lawn and garden equipment and consumer product use including household cleaners, paints, cosmetic and hair products, cleaning solvents, adhesives and insecticides. Sources of VOCs also include natural biogenic emissions.

The VOC and carbonyl measurements at the PAMS site are only taken during the peak part of the ozone season, from June 1 to August 31 each year (the full monitoring ozone season in New Jersey runs from March 1 to October 31).[47] Historical total non-methane organic carbon (TNMOC) concentrations are summarized in Figure 2-8 for the New Jersey site at Rutgers New Brunswick and the New York site at the Bronx Botanical Garden. TNMOC is identical to VOCs but excludes methane (a regulatory exempt VOC).

Figure 2-8 shows that overall concentrations of TNMOC at the PAMS monitors have decreased from 1995 to 2022, similar to monitored ozone concentrations. The concentrations level off and show a mostly flat trend at both monitors since 2010.

[46] USEPA's ozone air quality definition of volatile organic compounds is defined at 40 CFR 51.100(s). New Jersey's ozone air quality rules reference USEPA's definition.
[47] 80 Fed. Reg. 65291 (October 26, 2015)

Figure 2-8: Total Non-Methane Organic Carbon (TNMOC), Peak Ozone Season Average 1995-2022



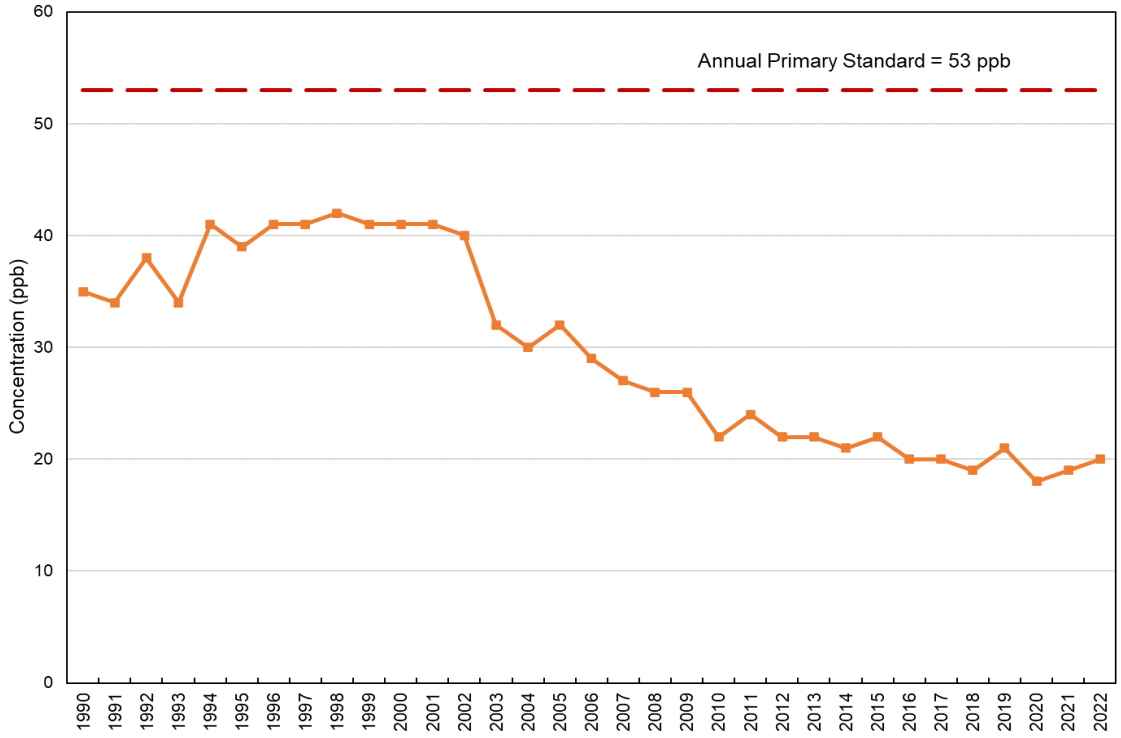
2.3.2 Nitrogen Dioxide

Nitrogen oxides consist of a mixture of gases comprised mostly of nitric oxide (NO) and nitrogen dioxide (NO_2). Although most NO_x is emitted as NO, it is readily converted to NO_2 in the atmosphere. NO_2 is a reddish-brown highly reactive gas that is formed in the air through the oxidation of NO. In the troposphere, near the Earth's surface, NO_2, not molecular oxygen, provides the primary source of the oxygen atoms required for ozone formation. These gases are emitted from a variety of sources such as the exhaust of motor vehicles, boats, planes and locomotives, the burning of coal, oil or natural gas, residential wood burning, forest fires, manufacturing and industrial processes.

NO_x concentrations in ambient air are higher in the winter compared to the summer partially because poorer local dispersion conditions caused by light winds and other weather conditions are more prevalent in the colder months of the year. On average, peak concentrations of NO_x (NO_2 and NO) have been observed in the morning and afternoon hours. This trend coincides with motor vehicle rush hours.

Currently, New Jersey monitors NO_2 and NO levels at 10 locations in the Continuous Air Monitoring Network, including the PAMS measurements of NO_x, NO_2, and NO. Historical NO_2 concentrations are summarized in Figure 2-9. As shown in Figure 2-9, NO_2 levels have decreased in New Jersey from 1990-2022, similar to monitored ozone concentrations. The concentrations level off and show a slightly decreasing trend since 2010.

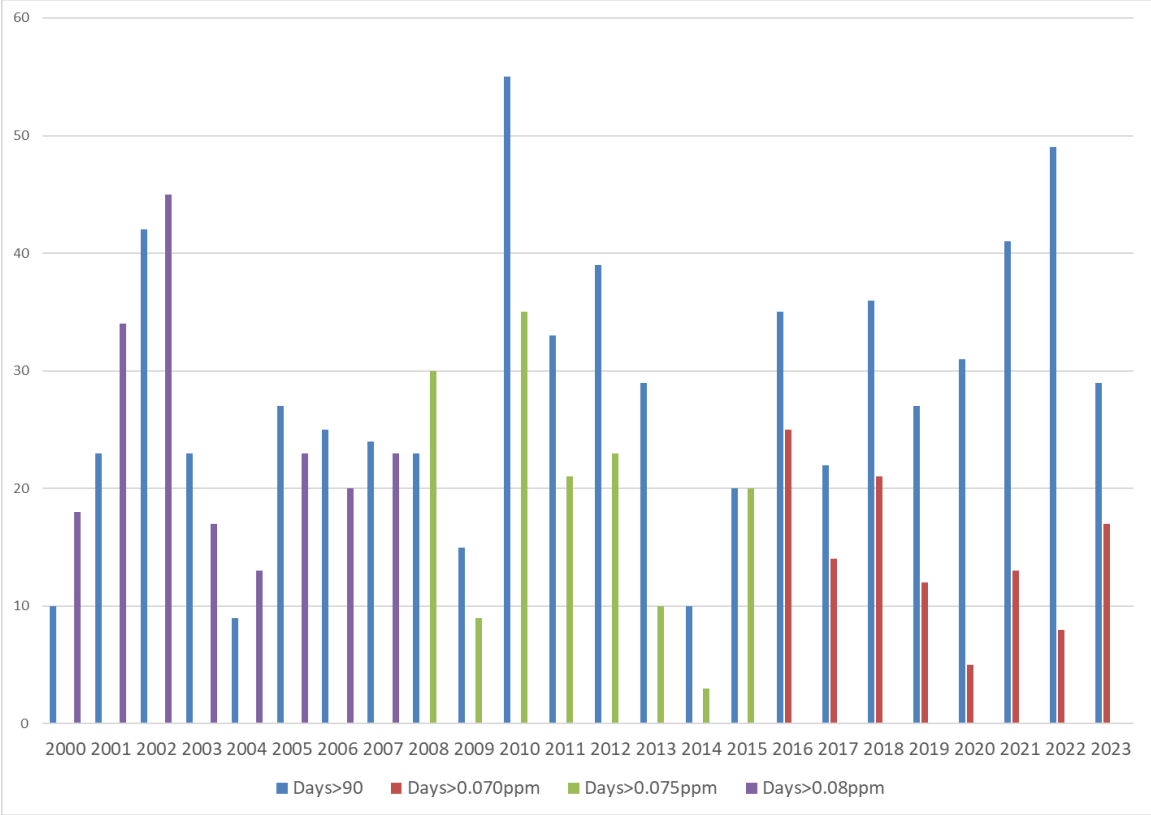
Figure 2-9: Nitrogen Dioxide Highest Annual (Calendar Year) Average Concentration, 1990-2022, New Jersey Statewide



2.4 New Jersey Meteorological Trends

Ozone formation is influenced by many factors including weather conditions, transport, and growth in emissions, in addition to changes in emissions brought about by air quality control strategies. Of these factors, weather has a significant effect on year-to-year variations in ozone levels. As previously stated, ozone is not emitted directly to the atmosphere, but is formed by photochemical reactions between VOCs and NO_x in the presence of sunlight. The hot days of summer are particularly conducive to ozone formation, and as such ozone levels are of general concern during the months of May through September. Hot summers usually produce long periods of elevated ozone concentrations, while ozone production is typically limited during cool and wet summers. A comparison of the number of days the 8-hour ozone standard "in place" at the time was exceeded to days above 90 degrees Fahrenheit is shown in Figure 2-10. As shown in Figure 2-10, from 2000 to 2008, there were more days when the 8-hour ozone NAAQS of 84 ppb was exceeded than there were "hot" days. However, from 2009 to 2023, there were more "hot days" than ozone exceedances, even when the standards were much lower at 75 ppb from 2008 to 2015 and 70 ppb after 2016. This indicates that there are other factors besides meteorology that have a significant effect on ozone levels in New Jersey, such as New Jersey's rules to control and reduce emissions and most specifically from power plants that operate on High Electric Demand Days which had a Phase I effective date in 2009.

Figure 2-10: Number of Days the 8-Hour Ozone Standard was Exceeded vs. Days Above 90 Degrees Fahrenheit 2000-2023 New Jersey Statewide



Note: 2023 values include exceptional events

2.5 Exceptional Events

The Clean Air Act (CAA) Section 319(b) allows states to exclude air quality monitoring data influenced by exceptional events from use in determinations of exceedances or violations of the NAAQS. According to 40 CFR 50.1(j), the definition of an "exceptional event" (EE) means "an event(s) and its resulting emissions that affect air quality in such a way that there exists a clear causal relationship between the specific event(s) and the monitored exceedance(s) or violation(s), is not reasonably controllable or preventable, is an event(s) caused by human activity that is unlikely to recur at a particular location or a natural event(s), and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event."

While the wildfires caused ozone exceedances throughout both of New Jersey's multi-state nonattainment areas, NJDEP has chosen to submit an exceptional event demonstration for the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area because the wildfire events are preventing the area from being eligible for a one-year extension to demonstrate compliance with 2015 70 ppb 8-hour ozone NAAQS by the attainment date of August 3, 2024. An exceptional event demonstration for the Northern NJ-NY-CT Nonattainment area would not result in a change in compliance status for the area, and therefore, is not necessary.

During the periods of April 13, June 2, and June 29 and 30, 2023, the ozone air quality in New Jersey and throughout the region experienced uncommonly high exceedances of the ozone

NAAQS at 4 to 12 monitors on any one day during that period. New Jersey has submitted a proposed demonstration "Exceptional Event Demonstration Analysis for Ozone During April 13, 2023, June 2, 2023, June 29 and 30, 2023," dated March 2024 to USEPA. This demonstration requested the exclusion of ozone air quality data for April 13, June 2, and June 29 and 30, 2023 due to the impact from certain wildfire events on the 4th high maximum 8-hour ozone value, which is used to calculate the ozone design values for determining attainment of the NAAQS. New Jersey's exceptional event analysis was posted on the NJDEP website for public review on March 27,2024 and can be found at https://dep.nj.gov/wp-content/uploads/airplanning/exceptional-events/public-notice-and-2023-ozone-ee-demo.pdf. This demonstration shows that high ozone levels measured on April 13, 2023, June 2, 2023, June 29 and 30, 2023 were influenced by wildfires in Kansas (April 13), Western Canada and Nova Scotia (June 2), and Quebec, Canada (June 29 and 30).

Other states within the Southern NJ-PA-DE-MD Nonattainment Area are also excluding monitoring data due to exceptional events during the 2023 ozone season. The Maryland Department of the Environment (MDE), the Delaware Department of Natural Resources and Environmental Control (DNREC), and the Pennsylvania Department of Environmental Protection (PADEP) have developed or are in the process of developing exceptional event demonstrations to exclude ozone monitoring data from the 2023 ozone season.

Table 2-1 compares the 4th high 8-hour maximum values, including and excluding the exceptional event days of April 13, June 2, and June 29 and 30, 2023, at the affected monitors in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area. The 4th high maximum 8-hour ozone values after excluding exceptional event influences see a decrease of up to 6 ppb. The demonstration shows that with the exclusion of the exceptional events, the 4th high maximum ozone values in 2023 are below the 2015 70 ppb 8-hour ozone NAAQS and the three year design values are in compliance with the standard in 2023 in the New Jersey portion of the Southern NJ-PA-DE-MD.

Table 2-1:
Comparison of 4th High Maximum 8-Hour Ozone Including and Excluding the April 13, June 2, June 29 and 30 Exceptional Event Data

State	Monitor Site Name	Site No.	2023 Ozone 4th Max (ppb) Including EE Data (A)	2023 Ozone 4th Max (ppb) Excluding EE Data (B)	Change in Ozone (ppb) (A-B)	Preliminary Design Value Including EE Data	Preliminary Design Value Excluding EE Data
NJ	Camden Spruce St	340070002	71	67	4	67	65
NJ	Clarksboro	340150002	74	68	6	70	68
NJ	Colliers Mills	340290006	73	68	5	70	68
NJ	Washington Crossing	340219991	71	68	3	67	66

2.6 Monitoring Summary

Northern NJ-NY-CT Nonattainment Area

The Northern NJ-NY-CT Nonattainment Area monitor with the highest 8-hour ozone design value of 81 ppb in 2022 is located in Connecticut at the Stratford monitor followed by 80 ppb at Westport (Sherwood Island Connector) in Connecticut. Preliminary monitoring data for the Northern NJ-NY-CT nonattainment area for the 2023 ozone season indicate that the highest design values continue to be the four monitors on the north side of the Long Island Sound in Connecticut. The data show 81 ppb at Westport, 79 ppb at Stratford, 78 ppb at Madison, and 75 ppb at Greenwich.

Although the design values indicate that the Northern NJ-NY-CT nonattainment area is not in compliance with the 2015 70 ppb ozone standard for the 2020-2022 period or the preliminary 2021-2023 period, the 2023 certified monitoring data for New Jersey shows that all of the New Jersey monitors are below the 70 ppb standard, with the exceptional events included, with the exception of Rutgers at 71 ppb. The Rutgers monitor's design value is most likely elevated due to the influence of the significant wildfires.

New Jersey's 8-hour ozone design values in the northern area have demonstrated significant decreases over time and have been in compliance with the 75 ppb 8-hour ozone standard since 2014 and the 70 ppb 8-hour ozone standard since 2022, with the exception of Rutgers at 71 ppb, which was influenced by the significant wildfires.

Southern NJ-PA-DE-MD Nonattainment Area

The Southern NJ-PA-DE-MD Nonattainment Area monitor with the highest 8-hour ozone design value of 72 ppb in 2022 is located in Pennsylvania at the Bucks (Bristol) monitor. The highest preliminary 2023 design value for the Southern NJ-PA-DE-MD nonattainment area is 73 ppb at the Bucks (Bristol) monitor in PA but includes exceptional event data on days with significant wildfires.

Although the design values at the Bucks monitor indicate that the Southern NJ-PA-DE-MD nonattainment area is not in compliance with the 2015 70 ppb ozone standard for the 2020-2022 period or the preliminary 2021-2023 period, the 2023 certified monitoring data for New Jersey shows that all of the New Jersey monitors are below the 70 ppb standard, with the exceptional events included.

New Jersey's 8-hour ozone design values in the southern area have demonstrated significant decreases over time and have been in compliance with the 75 ppb 8-hour ozone standard since 2018 and have been in compliance with the 70 ppb 8-hour ozone standard since 2021.

In order to qualify for a one-year extension of the attainment date, the 4th highest annual monitored values in the compliance year, which is 2023, need to be below the standard. Currently there are four monitors in New Jersey and four monitors in Pennsylvania that have 4th highest annual monitored values over the 70 ppb 8-hour ozone standard. These values were significantly influenced by the significant Canadian wildfires. New Jersey and Pennsylvania are submitting requests to USEPA to exclude the data influenced by the Canadian wildfires in accordance with federal regulations. With this data excluded, the nonattainment area will quality for a one-year extension of the attainment date.

Chapter 3 CONTROL MEASURES

3.1 Reasonably Available Control Measures (RACM)

This section provides a discussion of reasonably available control measures (RACM) for attainment of the 2015 70 ppb 8-hour ozone NAAQS. This includes a demonstration that New Jersey has adopted all reasonable measures (including Reasonably Available Control Technology (RACT)) to meet Reasonable Further Progress (RFP) requirements and to reach attainment as expeditiously as practicable. In addition, New Jersey demonstrates that no additional reasonably available measures would advance the attainment date by a minimum of one year.

In accordance with Section 172(c)(1) of the CAA (or 42 U.S.C. §7502(c)(1)), states are required to implement all RACM as expeditiously as practicable as part of their effort to attain the NAAQS. Specifically:

> "In general – Such plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards."

The 2018 Ozone Implementation Rule[48] for the 2015 70 ppb 8-hour ozone NAAQS, describes what the states must include with their attainment demonstration regarding RACM. The USEPA interprets RACM as a demonstration that the state has adopted all reasonable measures (including RACT) to meet RFP requirements and to demonstrate attainment as expeditiously as practicable. USEPA also requires an analysis to determine if there are any additional RACM that will advance the attainment date by at least one year. USEPA rules and guidance indicate that states should consider all available measures, including those being implemented in other areas, and that a state must adopt measures for an area only if those measures are economically and technologically feasible, and will advance the attainment date or are necessary for RFP.

RACM is further defined by the USEPA[49,50] as any potential control measure for application to point, area, onroad and nonroad emission source categories that meets the following criteria:

- The control measure is technologically feasible;
- The control measure is economically feasible;
- The control measure does not cause "substantial widespread and long-term adverse impacts";
- The control measure is not "absurd, unenforceable, or impracticable";
- The control measure can advance the attainment date by at least one year.

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[48] 83 Fed. Reg. 62998 (December 6, 2018)

[49] USEPA Memorandum, "Guidance on the RACM Requirement and Attainment Demonstration Submissions for Ozone Nonattainment Areas", from John S. Seitz, USEPA Director Office of Air Quality Planning and Standards to the USEPA Regional Air Division Directors Regions I-IX, dated November 1999.

[50] USEPA Memorandum, "Additional Submission on RACM From States with Severe 1-hour Ozone Nonattainment Area SIPs", from John S. Seitz, USEPA Director office of Air Quality Planning and Standards and Marge Oge, USEPA Director Office of Transportation and Air Quality to Regional Air Division Directors, Regions I, II, III, V and VI, December 14, 2000.

The New Jersey RACM analysis and conclusions for the 2015 70 ppb 8-hour ozone NAAQS moderate classification rely on and build on the RACM analyses conducted for the 1997 84 ppb and 2008 75 ppb 8-hour ozone NAAQS. These analyses were documented in New Jersey's 2007 Ozone SIP for the 1997 84 ppb ozone NAAQS (2007 Ozone SIP)[51] , 2017 Ozone SIP for the 2008 75 ppb ozone NAAQS moderate classification (2017 Ozone SIP)[52] and 2021 Ozone SIP for the 2008 75 ppb ozone NAAQS serious classification (2021 Ozone SIP)[53]. A significant amount of control measures has been adopted and implemented by New Jersey that are RACM and beyond RACM.

The New Jersey RACM analysis documented in the 2007 Ozone SIP includes:

- a compilation of an exhaustive list of potential control measures from numerous sources including a public workshop conducted by New Jersey;
- an evaluation of the feasibility of the measures in accordance with RACM guidance;
- an evaluation of the potential emission benefits from the measures;
- a list of measures adopted and implemented by New Jersey;
- an evaluation of the potential for additional measures to advance the attainment date.

This SIP expands on this analysis by documenting the additional RACM adopted and implemented by New Jersey since the 2007 SIP.

The list of potential and actual adopted measures was developed through a combination of evaluations over several years that included State-specific and regional workgroups. As discussed in the 2007 SIP, New Jersey held a workshop and formed various workgroups with stakeholders to evaluate potential control measures. New Jersey also participates in several regional workgroups with the goal of identifying RACM to help the States reach their 8-hour ozone attainment goals. New Jersey is an active member of four regional organizations, each with a unique focus with respect to either geographic area, air pollution or both. These organizations include the following:

Ozone Transport Commission (OTC): The OTC provides a forum through which states work together to evaluate new control measures and strategies to reduce ozone and create model rules for states to consider in their regulatory process. The 1990 CAA amendments established the OTC for this purpose. The OTC consists of 12 northeast states and the District of Columbia. New Jersey is an active member of all control specific workgroups.

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[51] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard, Final 8-Hour Ozone Attainment Demonstration, October 29, 2007.

[52] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard,1997 84 ppb and 2008 75 ppb 8-Hour Ozone Attainment Demonstration Northern New Jersey-New York-Connecticut Nonattainment Area and Nonattainment New Source Review (NNSR) Program Compliance Certification New Jersey Statewide, December 22, 2017.

[53] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, 2008 75 ppb 8-Hour Ozone Attainment Demonstration, Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications, and 2017 Periodic Emissions Inventory, November 18, 2021.

As a member of the OTC, New Jersey has worked jointly with the other members to assess the nature and magnitude of the ozone problem in the region, evaluate potential new control strategies and recommend regional control measures to help towards the common regional goal of attainment and maintenance of the ozone NAAQS.

To support the goal of attainment of the ozone NAAQS, OTC staff and member states formed several workgroups to identify and evaluate candidate control measures. The OTC workgroups have reviewed over 1,000 candidate control measures. These control measures were identified through sources such as control measures in California (a leader in air quality), USEPA's Control Technique Guidelines (CTGs), STAPPA/ALAPCO's (now NACAA) "Menu of Options" documents, the AirControlNET database, emission control initiatives in other states and stakeholder input.

The control measures were evaluated for technical feasibility, emissions reductions, cost effectiveness and ease of implementation. Summaries of OTC/State evaluations and model rules developed since 2000 can be found on their website at http://www.otcair.org.

Mid-Atlantic Regional Air Management Association (MARAMA): MARAMA coordinates regional modeling inventories and projections.

Mid-Atlantic Northeast Visibility Union (MANEVU): MANEVU coordinates Regional Haze work and plans, including potential control measures for pollutants that also contribute to ozone formation.

Northeast States for Coordinated Air Use Management (NESCAUM): NESCAUM provides a forum through which states work together to evaluate new control measures and conducts technical projects and work that support state's efforts towards ozone control.

A summary of RACM and RACT measures adopted and implemented in New Jersey is included below in Control Measures Section 3.3.

3.1.1 Reasonably Available Control Technology (RACT)

A subset of RACM are the NO_x and VOC control measures that implement a RACT level of control on a major emission source or source category. The CAA Sections182(b)2, 184(b)(1) and 182(f) and USEPA's 2018 Ozone Implementation Rule[54] require moderate and above nonattainment areas and all states in the Ozone Transport Region, including New Jersey, to adopt RACT for all existing VOC and NO_x source categories covered by a Control Techniques Guideline (CTG), and for all other major sources of VOC and NO_x, including those covered by Alternative Control Techniques (ACT).

New Jersey submitted its statewide RACT analysis SIP Revision on November 19, 2021[55], for the 2015 70 ppb 8-hour ozone NAAQS for a moderate classification, which meets all of these requirements. This analysis is applicable for New Jersey's northern and southern nonattainment area obligations as well as the Ozone Transport Region (OTR) obligations.

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[54] 83 Fed. Reg. 63007 (December 6, 2018)

[55] The State of New Jersey, Department of Environmental Protection, State Implementation Plan (SIP) Revisions, 2008 75 ppb 8-Hour Ozone Attainment Demonstration Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications and 2017 Periodic Emissions Inventory75 ppb 8-Hour Ozone National Ambient Air Quality Standard, November 18, 2021.

The New Jersey RACT applicability threshold is 25 tons per year (tpy) for both NO_x and VOCs for the entire State, even though the entire State is not classified as severe nonattainment. The CAA allows a RACT applicability threshold of 100 tpy for facilities located in a moderate nonattainment area and ozone transport region, 50 tpy for facilities located in a serious nonattainment area and 25 tpy for facilities located in a severe nonattainment area. New Jersey has been implementing the RACT requirements for existing major sources of NO_x using the 25 tpy applicability threshold since 1992, which is based on a severe 1-hour ozone classification. New Jersey's RACT analysis and implementation of RACT control measures are based on the applicability threshold for severe nonattainment areas, which is more stringent than the RACT applicability threshold for moderate nonattainment areas and therefore satisfies the moderate requirements.

RACT is defined by the USEPA as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.[56] The RACT State Implementation Plan (SIP) requirements that must be addressed include revised RACT rules, certifications where appropriate that existing rule provisions continue to be RACT, and negative declarations that there are no sources covered by a specific CTG source category.[57] States should provide for implementation of RACT as expeditiously as possible to help attain the 70 ppb ozone National Ambient Air Quality Standard.[58]

A summary of RACM and RACT measures adopted and implemented in New Jersey is included below in Control Measures Section 3.3. New Jersey has met RACT requirements and has gone beyond RACT by adopting control measures more stringent than Federal rules, CTGs and neighboring state rules, especially those of most importance that address NO_x on high ozone days, setting the standard for what modern RACT should be. On June 5, 2023, the USEPA published its final Good Neighbor Plan entitled "Federal 'Good Neighbor Plan' for the 2015 Ozone National Ambient Air Quality Standards" effective August 4, 2023, which secures reductions in ozone-forming emissions of NO_x from power plants and industrial facilities.[59] The 2015 Transport Rule includes industrial (non-EGU) control measures, some of which were modeled after New Jersey's RACT rules.

Of particular note are the following New Jersey RACT rules:

- Power Plants: In 2009, New Jersey adopted enforceable, short-term, performance standards for NO_x and VOC emissions from power plants (or Electric Generating Units (EGUs)) that were among the most stringent and effective air pollution control regulations.

  Also, in 2009, New Jersey adopted measures to address emissions from EGUs that operate on High Electric Demand Days (HEDDs) when ozone concentrations tend to be elevated. These sources are critically important contributors to episodes of elevated ozone in the Northern NJ-NY-CT Nonattainment Area. New Jersey received significant emission reductions from the HEDD rules. New Jersey has reduced NO_x emissions from power plants an estimated 64 tons per day on HEDD since implementation of the rule, with Phase I in 2009 and Phase II in 2015.

[56] 44 Fed. Reg. 53762 (September 17, 1979)
[57] 83 Fed. Reg. 63007 (December 6, 2018)
[58] Ibid
[59] 88 Fed. Reg. 36654 (June 5, 2023)

- Presumptive NO_x limits and Alternative Emission Limits (AELs): New Jersey has been implementing significantly stringent presumptive NO_x emission limits for several source categories including boilers serving electric generating units, stationary combustion turbines, ICI boilers and other indirect heat exchangers, stationary reciprocating engines, asphalt pavement production plants, glass manufacturing furnaces, municipal solid waste incinerators and sewage sludge incinerators. New Jersey's April 20, 2009, RACT rule adoption for 14 source categories, including storage tanks is available at https://www.nj.gov/dep/rules/adoptions/adopt_090420.pdf. For those existing sources that cannot implement the presumptive NO_x RACT requirements for technology and cost effectiveness reasons, New Jersey's RACT rules require that any AEL approved by the Department after May 19, 2009, have a term of 10 years. This is New Jersey's unique feature of RACT determinations.

- Distributed Generation/Demand Response (DG/DR): New Jersey's rules for stationary reciprocating internal combustion engines (RICE) do not allow the use of uncontrolled engines for the purpose of distributed electric generation or demand response in non-emergency situations. However, in some states these engines are uncontrolled and used to assist the electric grid during high electric demand periods. Like HEDD EGUs, many of these engines operate on hot summer days that usually coincide with the high ozone days.

- Sewage Sludge Incinerators and Municipal Solid Waste Incinerators: New Jersey has implemented measures to control NO_x emissions from the sewage sludge incinerators and municipal solid waste (MSW) combustors. New Jersey has taken significant actions to address these important sources.

- State of the Art (SOTA): The Air Pollution Control Act of New Jersey at N.J.A.S. 26:2C requires advances in the art of air pollution control. New Jersey regulations at N.J.A.C 7:27-8.12 use the term SOTA and require SOTA to be implemented for new, modified, or reconstructed equipment at major and minor facilities for new VOC and NO_x sources of air pollution. New Jersey has also developed SOTA manuals for several source categories. These SOTA manuals are updated periodically. The SOTA manual for municipal solid waste landfills and the SOTA manuals for stationary combustion turbines were revised in May 2023 and September 2023, respectively. These manuals are available at https://www.state.nj.us/dep/aqpp/sota.html.

- Petroleum Storage: New Jersey has implemented one of the most stringent petroleum storage rules in the country, which established requirements to reduce VOC emissions from bulk petroleum storage facilities.

For effective implementation of the CAA RACT provisions, USEPA should consider the following suggestions:

- USEPA should update its CTGs and ACTs. Many of the CTGs and ACTs are outdated and no longer represent RACT due to technological advances. Updating these guidelines would set a nationwide baseline for "presumptive norms" and provide consistency in states' RACT determinations for CTG and ACT source categories. While states have the responsibility to develop RACT rules based on currently available

control technologies, having updated Federal guidance would help promote consistency and reduce conflict when USEPA reviews and proposes RACT plans. This would especially be useful for gas, oil, and coal fired EGUs.

- While USEPA has made significant strides regarding transport rules, more can still be done by USEPA like lower enforceable daily NO_x performance standards for EGUs and distributed generation units, similar to those implemented in New Jersey and other states. And the timeline for implementation of new caps, limits and/or controls should be shortened. The transport rule does not eliminate significant contribution within the timeframe required by the CAA.

Control Techniques Guidelines and Alternative Control Techniques

States within the Ozone Transport Region must require RACT for all source categories of VOC covered by a Control Techniques Guidelines (CTG), and for all other major sources of VOC and NO_x.[60] The CTGs were developed by the USEPA to help states identify VOC RACT requirements for certain source categories and are considered presumptive RACT.[61] There are no CTGs for NO_x sources.

The USEPA also issued technical documents that identify controls for certain categories of stationary sources of NO_x and VOC. Known as Alternative Control Techniques (ACTs), these documents describe available control techniques and their cost effectiveness, but do not define presumptive RACT levels as the CTGs do.[62] These are to assist states in evaluating RACT for select sources of NO_x or VOC not covered by a CTG.

As discussed in the November 2021 RACT SIP and summarized in Table 11-2 of the 2021 RACT SIP, all New Jersey source categories continue to meet or exceed the required CTGs. There are no changes to this table to date.

Negative Declarations

By comparing the list of existing CTGs and ACTs with the NJDEP's effective rules and researching the emission statements and permitting databases for source categories by the North American Industry Classification System (NAICS), the NJDEP has determined that the following source-specific categories either do not exist in this State or fall below significant emission unit applicability thresholds in the CTGs and ACTs.

1. Manufacture of Vegetable Oils;
2. Manufacture of Pneumatic Rubber Tires;
3. Aerospace Coatings;
4. Iron and Steel Mills;
5. Cement Manufacturing;
6. Nitric and Adipic Manufacturing Plants;
7. Shipbuilding and Ship Repair Operations;
8. Metal Furniture Coatings;
9. Large Appliance Coatings;
10. Auto and Light Duty Truck Original Equipment Manufacturer (OEM) Assembly Coatings;
11. Oil and Gas Industry

[60] 78 FR 34192, June 6, 2013, and 83 FR 63007, December 6, 2018
[61] 78 FR 34192, June 6, 2013, and 83 FR 63007, December 6, 2018
[62] Ibid.

Update of New Jersey's Facility-Specific Emission Limits, Alternative Emission Limits and Alternative Control Plans

The requirement to review and update RACT also applies to all source-specific RACT limits. In New Jersey, facilities that have sources with potential to emit NO_x or VOC above major source thresholds, and for which no RACT limit has been established, are required to develop facility-specific emission limits (FSELs) for NO_x or a facility-specific control plan (FSCP) for VOCs. Similarly, facilities that are not reasonably able to comply with RACT limits in the rules may request alternative emission limits (AELs) for NO_x or alternative control plans (ACPs) for VOC. If approved by the NJDEP after public notice and comment, these are submitted to USEPA as SIP revisions.

The amended 2009 RACT rules at N.J.A.C. 7:27-16.17[63] and N.J.A.C. 7:27-19.13[64] required any facility with an AEL, ACP, FSEL or FSCP to meet the revised RACT rules if applicable for a given piece of equipment or source operation or reapply for a new source-specific limit. Many of these facilities subsequently met the adopted RACT standards after the original AEL or ACP and did not need to reapply. Other sources with FSELs, such as municipal waste combustors and sewage sludge incinerators, complied with new RACT limits. Equipment such as process heaters and fluid catalytic cracking units (FCCUs) at petroleum refineries became subject to more stringent emission limits due to a Federal enforcement initiative. Consequently, the number of case-by-case RACT limits has been reduced significantly.

The NJDEP has reviewed the State's existing AELs, ACPs, FSELs and FSCPs. The NJDEP has determined that facilities with a State-approved AEL, ACP, FSEL or FSCPs meet RACT for the 70 ppb ozone standard moderate classification. Facilities with pending AEL or ACP applications will be evaluated and submitted as SIP revisions if approved by the NJDEP. A summary of facilities in New Jersey with an existing, or pending, AEL, ACP, FSEL or FSCP, and approval status is shown below in Table 3-1.

[63] An FSEL has no expiration date and remains in place unless source becomes subject to a new RACT rule.
[64] Any AEL or ACP approved by the Department after May 19, 2009, has a term of 10 years.

Table 3-1: Status of NO_x and VOC Source-Specific RACT Determinations

Facility	County	ID/Source	Type	NJDEP Approval Date	USEPA Approval Date	NJDEP Expiration Date	Status	Does NJ anticipate submitting SIP revision?
Anheuser-Busch	Essex	PI#07551, BOP200002, can fillers	ACP VOC	Under NJDEP Review	Under NJDEP Review	None	Under NJDEP Review	Under NJDEP Review
Buckeye Pennsauken Terminal	Camden	PI#51606, PSP130001, external floating roof tanks	ACP VOC	8/21/14	10/11/19	8/20/24	ACP will terminate on expiration date	Yes, a termination
Buckeye Port Reading Terminal	Middlesex	PI#17996, BOP230001, external floating roof storage tanks	ACP VOC	8/21/14	10/11/19	8/20/24	Application submitted to NJDEP for a new ACP. Under NJDEP Review	Yes
Gold Bond Building Products	Burlington	PI#45980, BOP 180001, board dryer	ACP VOC	Under NJDEP Review	Under NJDEP Review	Under NJDEP Review	Under NJDEP Review	Under NJDEP Review
Paulsboro (Formerly Valero Refining Co and Mobil Oil Corp)	Gloucester	PI#55829, BOP130002, external floating roof tanks	ACP VOC	12/21/15	10/11/19	12/20/25	Expires 12/20/25	No
Phillips 66 (Formerly Conoco Phillips and Bayway Refining)	Union	PI#41805, PSP130002, external floating roof tanks	ACP VOC	7/12/16	10/11/19	7/11/26	Expires 7/11/26	No
Joint Base McGuire Dix Lakehurst	Ocean	PI#78897, BOP150001, PSP130001, boilers #2 & #3	AEL NO_x	8/26/16	8/10/17	8/25/26	Expires 8/25/26	No
Naval Weapons Station Earle	Monmouth	PI#21138, PSP090002, two diesel engines	AEL NO_x	5/21/09	11/14/11	5/20/19	Application to remove engines under NJDEP review	Yes, a termination

Table 3-1 (continued): Status of NO_x and VOC Source-Specific RACT Determinations

Facility	County	ID/Source	Type	NJDEP Approval Date	USEPA Approval Date	NJDEP Expiration Date	Status	Does NJ anticipate submitting SIP revision?
Transcontinental Gas Pipelines Corp., LNG Station 240	Bergen	PI#02626, PSP110001, four natural gas- fired water bath heaters	AEL NO_x	7/10/14	8/10/17	7/9/24	Application to remove heaters approved by NJDEP on 2/05/24. The AEL will terminate on expiration date	Yes, a termination
Vicinity Energy/Veolia (Formerly Trigen-Trenton Energy)	Mercer	PI#61015, BOP040002, internal combustion engines.	AEL NO_x	1/11/07	7/16/08	None	No Action Needed	No
CMC Steel NJ	Middlesex	PI#18052, BOP150002, electric arc furnace	FSCP VOC	4/30/19	2/17/21	None	No Action Needed	No
CMC Steel NJ	Middlesex	PI#18052, BOP150002, electric arc furnace	FSEL NO_x	4/30/19	2/17/21	None	No Action Needed	No
CMC Steel NJ	Middlesex	PI#18052, BOP150001, billet reheat furnace	FSEL NO_x	3/27/18	5/30/19	None	No Action Needed	No
Gold Bond Building Products	Burlington	PI#45980, PSP120001, board dryer	FSEL NO_x	Under NJDEP Review	Under NJDEP Review	None	Under NJDEP Review	Yes
Johnson Matthey	Gloucester	PI#55788, BOP200001, furnace	FSEL NO_x	6/13/95	1/17/97	None	New anticipated permit application should terminate FSEL, estimated May 2025	Yes, a termination
McWane Ductile (Formerly Atlantic States Cast Iron Pipe Co.)	Warren	PI#85441, BOP080003, cupola and annealing oven	FSEL NO_x	11/22/94 10/25/10	10/20/98	None	Under NJDEP Review	Under NJDEP Review

A summary of facilities that no longer require an AEL, ACP, FSEL or FSCP due to plant closings, equipment shutdown, equipment replacement, or affected equipment now operating in compliance with adopted RACT limits is shown below in Table 3-2.

Table 3-2: List of Terminated Source-Specific Limits and Control Plans

Plant PI#	Facility	County
35884	3M	Somerset
18048	Air Products & Chemicals	Gloucester
26239	Algonquin Gas Transmission Hanover	Morris
18005	Amerada Hess Corp	Middlesex
73242	BL England, RC Cape May	Cape May
18058	Buckeye Perth Amboy Terminal	Middlesex
51614	Camden County Resource Recovery Facility	Camden
65495	Conectiv Atlantic Generation, Deepwater Station	Salem
65491	Dupont	Salem
7736	Essex County Resource Recovery Facility	Essex
51611	Georgia Pacific Gypsum	Camden
18045	Gerdau Ameristeel Corp Perth Amboy (formerly Co-Steel Raritan Corp) – terminated on August 17, 2009 by rule	Middlesex
55793	Gloucester County Resource Recovery Facility	Camden
45954	Griffin Pipe Co	Burlington
45904	Hoeganaes Corp	Burlington
60976	Homasote Company	Mercer
7906	Lafarge Gypsum (formerly Continental Gypsum) Port Newark	Essex
41722	Linden Compressor Station	Union
26173	Novartis Pharmaceuticals (Sandoz)	Morris
65530	Oxyvinyls LP (formerly Geon Co.)	Salem
26209	Parsippany-Troy Hills Sewage Treatment Plant	Morris
17767	PQ Corporation	Middlesex
12202	PSEG Hudson	Hudson
41708	Schering	Union
35857	Somerset Raritan Valley Sewerage Authority	Somerset
61036	Stony Brook Regional Sewerage Treatment Authority	Mercer
55781	Sunoco Eagle Point (formerly Coastal Eagle Point Oil)	Gloucester
26187	Texas Eastern Hanover	Union
80337	Texas Eastern Lambertville	Hunterdon
30436	Twp. of Wayne, Mountain View Water Pollution Control Facility	Passaic
41814	Union County Resource Recovery Facility	Union
7726	University of Medicine and Dentistry of New Jersey	Essex
65498	US Generating Co, Carneys Point	Salem
55834	US Generating Co, Logan	Gloucester
45968	US Pipe & Foundry	Burlington
85455	Warren County Resource Recovery Facility	Warren

RACT Conclusions and Certification

New Jersey certifies that the November 2021 RACT SIP for the 2015 8-hour ozone NAAQS moderate classification is applicable to both the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area and the Southern NJ-PA-DE-MD Nonattainment Area, as well as for the OTR in accordance with CAA Sections182(b)2, 184(b)(1) and 182(f) and USEPA's 2018 Ozone Implementation Rule. New Jersey certifies that all CTGs are addressed for major sources in the November 2021 RACT SIP for the Northern NJ-NY-CT Nonattainment Area and the Southern NJ-PA-DE-MD Nonattainment Area, as well as for the OTR, for a moderate classification. New Jersey certifies that the CTG and negative declaration summaries submitted in the November 2021 RACT SIP are still accurate for purposes of this SIP for the Southern NJ-PA-DE-MD Nonattainment Area moderate reclassification.

3.1.2 RACM to Advance the Attainment Date

As discussed above, the USEPA requires an analysis to determine if there are any additional RACM that will advance the attainment date by at least one year. If there are, the state is required to adopt those measures.

For the 2015 70 ppb ozone standard, New Jersey has an attainment date of no later than August 3, 2024. Therefore, in order for emission reductions to contribute towards attainment they must be achieved prior to the end of the 2023 ozone season because compliance with the NAAQS will be determined based on the 2021, 2022 and 2023 annual 4th high ozone levels. To advance the attainment date by one year, the potential RACM measures would have to achieve emission reductions before the end of the 2022 ozone season.

New Jersey has determined that there are no additional RACMs (in addition to what New Jersey has already adopted and implemented) available that meet the criteria discussed in Section 3.1 that can provide emission reductions sufficient to advance the attainment date by one year. In addition to this determination, no additional measures could be implemented in time to take effect prior to the end of the 2022 ozone season.

3.1.3 RACM Conclusions

New Jersey has adopted extensive control measures ahead of other states, especially those that address NO_x on high ozone days, setting the standard for what RACT should be, and has therefore met RACM and RACT requirements for the 2015 70 ppb ozone standard. The New Jersey control measures adopted and implemented since 2002 are summarized and discussed in Table 3-3 and Section 3.3. These measures constitute RACM and RACT for the 2015 70 ppb 8-hour ozone NAAQS.

3.2 Control Measures Being Submitted as SIP Revisions

On December 2, 2022, New Jersey adopted rules at 7:27F-2 that set new Electric Generating Unit (EGU) emission limits starting June 1, 2024. On December 2, 2022, New Jersey also adopted rules at 7:27F-3 that ban #4 and #6 fuel oil, with a compliance date in 2025 and a two year sell through period. These rules reduce emissions of carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides (NO_x), fine particulates (PM2.5), sulfur dioxide (SO_2) and volatile organic compounds (VOC).

The NJDEP is including these rules in this SIP Revision with the intention of submitting the adopted rules to USEPA for incorporation into New Jersey's ozone SIP. The NJDEP has enclosed courtesy copies of the rule proposal and rule adoption in Appendices 3-1 and 3-2. To obtain official versions of the rule proposal and rule adoption the New Jersey Office of

Administrative Law and LexisNexis® provide free online public access to the New Jersey Register at: https://advance.lexis.com/container?config=00JABkMGM5YTkyOS1lZWRkLTRmMTktOTAxMS03YzU0MTU1ZWY0OWYKAFBvZENhdGFsb2deD7LQBBLcCbuY7q4FNupa&crid=5804a7e5-d88f-4f46-9f8f-e11fb3897202&prid=a589636b-abb4-48ad-a539-60193c75df12. To obtain an official version of the final rules see the New Jersey Administrative Code at: https://advance.lexis.com/container?config=00JAA5OTY5MTdjZi1lMzYxLTQxNTEtOWFkNi0xMmU5ZTViODQ2M2MKAFBvZENhdGFsb2coFSYEAfv22IKqMT9DIHrf&crid=71da84cd-1f56-4b45-b288-d98ad2d31c4c.

3.3 Control Measures in the SIP

This section summarizes in Table 3-3 the control measures implemented in New Jersey since 2002 that reduce ozone precursors and aid in ozone attainment. A detailed discussion follows for the control measures implemented in New Jersey since 2011. The quantitative benefits from the implementation of these measures, and the emission reduction calculations, are included in Chapter 4.

Table 3-3: New Jersey's Post 2002 Ozone Control Measures

State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
State	Point	NO_x Budget	1999, 2003	NO_x, SO_2	NA	10/1/07	x				x	
State	Point	EGU: BL England Administrative Consent Order	2000-2015	NO_x, PM2.5, SO_2	NA	NA	x				x	
State	Point	EGU: PSEG-Consent Decree	2002-2010	NO_x, PM2.5, SO_2	NA	7/26/02; 11/30/06	x				x	
State	Area	Phase I and II Gasoline Vapor Recovery 2003	2003	VOC	7:27-16	7/2/04	x					x
State	Area	Consumer Products 2005	2005	VOC	7:27-24	1/25/06	x					x
State	Area	Architectural Coatings 2005	2005	VOC	7:27-23	11/30/05	x					x
State	Point, Area	Mobile Equipment Refinishing (Autobody)	2005	VOC	7:27-16	7/2/04	x				x	
State	Point, Area	Solvent Cleaning	2005	VOC	7:27-16	7/2/04	x				x	
State	Area	Portable Fuel Containers 2005	2005-2015 (1)	VOC	7:27-24	1/25/06	x					x
State	Point	Mercury Rule	2006-2012	Hg, PM2.5, SO_2, NO_x	7:27-27	NA	x				x	
State	Point	Refinery Consent Decree: ConocoPhillips	2006-2014	PM, SO_2, NO_x, VOC	NA	Filed 1/27/05	x				x	
State	Point	Refinery Consent Decree: Valero (Paulsboro)	2006-2014	PM, SO_2, NO_x, VOC	NA	Filed 6/16/05	x				x	
State	Point	Refinery Consent Decrees: Sunoco	2006-2014	PM, SO_2, NO_x, VOC	NA	Filed 12/2/03	x				x	
State	Point, Area	ICI Boilers, Turbines and Engines 2005	2007-2010	NO_x	7:27-27.19	7/31/07	x				x	

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures												
State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
State	Area	Asphalt Paving (cutback and emulsified)	2009	VOC	7:27-16.19	8/3/10	x				x	
State	Area	Consumer Products 2009	2009	VOC	7:27-24	7/22/10	x					x
State	Point, Area	Adhesives & Sealants	2009	VOC	7:27-26	7/22/10	x				x	
State	Point, Area	CTG: Printing	2009	VOC	7:27-16.7	8/3/10	x				x	
State	Point, Area	Sewage and Sludge Incinerators	2009	NO_x	7:27-19.28	8/3/10	x				x	
State	Onroad	New Jersey Low Emission Vehicle (LEV) Program	2009 (1)	NO_x, VOC, CO, PM2.5, SO_2	7:27-29	2/13/08	x					
State	Point, Area	Municipal Waste Combustors (Incinerators)	2009, 2010	NO_x	7:27-19.13	8/3/10	x				x	
State	Point	Asphalt Production Plants	2009, 2011	NO_x	7:27-19.9	8/3/10	x				x	
State	Point	EGU: High Electric Demand Day (HEDD)	2009, 2015	NO_x	7:27-19.29	8/3/10	x				x	
State	Point, Area	ICI Boilers 2009	2009-2011	NO_x	7:27-19.7	8/3/10	x				x	
State	Area	Portable Fuel Containers 2009	2009-2019 (1)	VOC	7:27-24	7/22/10		x	x			x
State	Onroad	IM: Program Revisions 2009	2010	VOC, NO_x, CO	7:27-15	9/16/11	x					x
State	Onroad	IM: Diesel Smoke Cutpoint	2010, 2011	PM2.5, NO_x	7:27-14	3/9/2023	x					x
State	Point	Petroleum Storage Tanks	2010-2019	VOC	7:27-16.2	8/3/10		x	x		x	
State	Onroad	Vehicle Idling Rule Amendments	2011	PM2.5, NO_x	7:27-14.1, 14.3	4/14/09	x					x
State	Point	Glass Manufacturing	2012	NO_x	7:27-19.10	8/3/10	x				x	

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures												
State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
State	Point	EGU: Coal-fired Boilers, Oil and Gas Fired Boilers	2013	NO_x, PM2.5, SO_2	7:27-4.2, 10.2,9.4	8/3/10	x				x	
State	Point, Area	Low Sulfur Fuel Oil	2014, 2016	PM2.5, SO_2, NO_x	7:27-9	1/3/12		x	x			x
State	Point	Refinery Consent Decree: Hess	2015	PM, SO_2, NO_x, VOC	NA	Filed 6/19/12	x				x	
State	Point, Area	CTG: Fiberglass Boat Manufacturing(2008 CTG)	2018	VOC	7:27-16.14	10/9/18		x	x		x	
State	Point, Area	CTG: Industrial Cleaning Solvents (2006 CTG)	2018	VOC	7:27-16.24	10/9/18		x	x		x	
State	Point, Area	CTG: Misc. Metal and Plastic Parts Coatings (2008 CTG)	2018	VOC	7:27-16.15	10/9/18		x	x		x	
State	Point, Area	CTG: Paper, Film, and Foil Coatings(2007 CTG)	2018	VOC	7:27-16.7	10/9/18		x	x		x	
State	Area	Phase I and II Gasoline Vapor Recovery 2017	2018	VOC	7:27-16	6/18/20				x		x
State	Point	Stationary Gas Turbines and Engines (NO_x ACT)	2020	NO_x	7:27-19.5, 19.8	10/9/18		x	x		x	
State	Point, Area	Permitting/Nonattainment New Source Review (NNSR) and Prevention of Significant Deterioration (PSD)	Ongoing	NO_x, VOC, PM2.5, SO_2	7:27-8,18, 22	NA		x	x			
State	Onroad, Nonroad	Voluntary Mobile Measures	Ongoing	NO_x, VOC, CO, PM2.5, SO_2	NA	NA				x		
Federal	Onroad	Tier 1 Vehicle Program	1994 (1)	NO_x, VOC, CO, PM2.5	NA	NA	x	x	x			
Federal	Onroad	Diesel Compression Ignition Engines	1996 - 2015 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x					

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures												
State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
Federal	Nonroad	Spark Ignition Engines, Equipment, and Vessels at or below 19 kW (Lawn and Garden and Small Watercraft)	1997 - 2016 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x					
Federal	Onroad	Refueling Onboard Refueling Vapor Recovery	1998 (1)	NO_x, VOC, CO, PM2.5	NA	NA	x	x	x			
Federal	Nonroad	Locomotive and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder Tier 0	1998 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Onroad	National Low Emission Vehicle Program (NLEV)	1999 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Locomotive and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder Tier 2	2002 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Onroad	Tier 2 Vehicle Program/Low Sulfur Fuels	2004 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Diesel Marine Engines over 37 kW: Category 1 Tier 2, Category 3 Tier 1	2004 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Large Industrial Spark-Ignition Engines over 19 kW (>50 hp) Tier 1	2004 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Onroad, Nonroad	Heavy-Duty Vehicle Standards and Diesel Fuel Sulfur Control	2004-2010 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Recreational Vehicles (Snowmobiles, Off-road Motorcycles, All-terrain Vehicles)	2006 - 2012 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Diesel Marine Engines over 37 kW: Category 2 Tier 2	2007 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Large Industrial Spark-Ignition Engines over 19 kW (>50 hp) Tier 2	2007 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Point	Petroleum Refineries NSPS Subpart JA		NO_x, VOC, SO_2	NA	NA		x	x			

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures												
State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
Federal	Nonroad	Locomotive and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder Tier 3	2008 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Nonroad	Diesel Marine Engines over 37 kW: Category 3 Tier 2	2011 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Area	Residential Woodstove NSPS	1988 and 2014	NO_x, VOC, CO, PM2.5	NA	NA	x	x	x			
Federal	Nonroad	Locomotive and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder Tier 4	2014 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Point	EGU: CSAPR, CSAPR Update, Revised CSAPR Update	2015, 2017, 2021	NO_x	NA	NA	x	x				
Federal	Point, Area	Boiler/Process Heater NESHAP	2016	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x					
Federal	Point	EGU: Mercury and Air Toxics Standards (MATS), Coal- and oil-fired	2016	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x					
Federal	Nonroad	Diesel Marine Engines over 37 kW: Category 3 Tier 3	2016 (1)	NO_x, VOC, CO, PM2.5, SO_2	NA	NA	x	x	x			
Federal	Point, Area	Natural Gas Turbine NSPS	2017	NO_x, VOC, CO, PM2.5, SO_2	NA	NA		x	x			
Federal	Point, Area	RICE NESHAP	2017	NO_x, VOC, CO, PM2.5, SO_2	NA	NA				x		
Federal	Point, Area	RICE NSPS	2017	NO_x, VOC, CO, PM2.5, SO_2	NA	NA		x				
Federal	Point, Area	Process Heater NSPS	2017	NO_x, VOC, CO, PM2.5, SO_2	NA	NA		x	x			
Federal	Onroad	Tier 3 Vehicle Program/ Fuel Standards	2017 (1)	NOx, VOC, CO, PM2.5, SO2	NA	NA		x	x			

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures												
State or Federal	Sector	Measure	Effective Start Date/ Range of Benefits	Pollutant	New Jersey Administrative Code	USEPA Approval	In Modeling Base Year	In 2023 Attainment Modeling	In 2023 RFP	Not in 2023 Attainment Modeling	RACT	RACM
Federal	Onroad	GHG Emission Standards for Passenger Cars and Light Trucks Through Model Year 2026	2023 (1)	GHGs, NO_x, VOC, CO, PM2.5, SO_2	NA	NA				x		
Federal	Point	EGU: Good Neighbor Plan	2023	NO_x	NA	NA				x		
Benefits Starting Post 2023												
State	Point	EGU Emission Limits	2024-2035	CO_2, CO,NO_x,PM2.5, SO_2, VOC	7:27F-2	Pending				x		
State	Onroad	Advanced Clean Trucks (ACT)	2025 (1)	CO_2, NO_x, PM2.5	7:27-31, 33	NS				x		
State	Nonroad	Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards	2025-2030	NO_x,PM2.5, Black Carbon	7:27-34	Pending				x		
State	Point, Area	#4 and #6 Fuel Oil Ban	2025	CO_2, NOx, SO_2	7:27F-3	Pending				x		
State	Onroad	IM: Heavy Duty OBD	2026 (estimate)	NO_x, VOC, CO, PM2.5, SO_2	7:27-14	5/9/18				x		
State	Onroad	IM: Medium Duty Diesel Vehicles (MDDVs)	2026 (estimate)	NO_x, PM2.5	7:27-14	NS				x		
State	Onroad	Advanced Clean Cars II	2027 (1)	CO_2, NOx, PM2.5	7:27-29A	NS				x		
State	Onroad	Heavy Duty New Engine Standards (Omnibus)	2027 (1)	NO_x	7:27-28A	NS				x		
Federal	Onroad	Heavy-Duty Engine and Vehicle Standards	2027 (1)	NO_x, VOC, CO, PM2.5	NA	NA				x		
Federal	Onroad	Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-duty and Medium-Duty Vehicles	2027 (1)	GHGs, NO_x, VOC,PM	NA	NA				x		
Federal	Onroad	Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3	2027 (1)	GHGs, NOx, VOC, PM, SO2	NA	NA				x		
Federal	Point	EGU: Mercury and Air Toxics Standards (MATS), Coal- and oil-fired	2028	NOx, VOC, CO, PM2.5, SO2	NA	NA				x		

Table 3-3 (continued) New Jersey's Post 2002 Ozone Control Measures

Legend/Notes:

1. Turnover rule which means measure has cumulative benefits each year until complete fleet or equipment turnover

CO = Carbon monoxide

CO_2 = Carbon dioxide

CSAPR = Cross-State Air Pollution Rule

CTG = Control Technology Guideline

EGU = Electric Generating Unit

FSELs/AELs = Facility-Specific Emission Limits/ Alternative Emission Limits

GHG = Greenhouse Gas

ICI = Industrial, Commercial and Institutional Boilers

IM = Inspection and Maintenance for Motor Vehicles

MACT = Maximum Achievable Control Technology

NA = Not Applicable

NESHAP = National Emission Standards for Hazardous Air Pollutants

NO_x = Nitrogen oxides

NS = Not Submitted

NSPS = New Source Performance Standards

OBD = On-board Diagnostics

PM2.5 = Fine Particulate Matter

RICE = Reciprocating Internal Combustion Engines

SO_2 = Sulfur Dioxide

VOC = Volatile Organic Compounds

State Rules: Point and Area Sources

Control Techniques Guidelines (CTG): Fiberglass Boat Manufacturing Materials (2008 CTG):

USEPA issued a CTG in 2008 that provides control recommendations for reducing VOC emissions from the use of gel coats, resins, and materials used to clean application equipment in fiberglass boat manufacturing operations. The CTG recommends the use of low-VOC content (monomer and non-monomer VOC) resin and gel coats with specified application methods. The CTG recommends the use of covers on mixing containers to further reduce VOC emissions from gel coats and resins. The CTG also recommends the use of low-VOC and low vapor pressure cleaning materials. Because the CTG recommendations are based on the 2001 National Emission Standards for Hazardous Air Pollutants (NESHAP) for boat manufacturing, those facilities that are major sources of HAP are already complying with the 2001 NESHAP and have already adopted these control measures. Because the 2001 NESHAP does not apply to area sources, area source fiberglass boat manufacturing facilities are not currently required to implement the measures provided in the NESHAP and recommended in the CTG. There are boat manufacturing facilities in ozone nonattainment areas that meet the applicability threshold in the CTG and would provide VOC emission reductions when the CTG recommended controls are applied. These control approaches are recommended for all fiberglass boat manufacturing facilities where total actual VOC emissions from all fiberglass boat manufacturing operations are equal to or exceed 15 pounds per day.

The NJDEP proposed new rules at N.J.A.C. 7:27-16.14 on January 3, 2017. The final rules were effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the USEPA CTG, which establish an applicability limit of actual VOC emissions, before add-on control, of 15 pounds per day from all fiberglass boat manufacturing operations. Exemptions include production of vessels that must meet military specifications and production of parts of boats that do not involve the manufacture of fiberglass. Compliance can be achieved by meeting a maximum monomer VOC content standard, meeting a maximum monomer VOC mass emission rate, or installation of a VOC control apparatus. Recordkeeping must be maintained which demonstrates compliance.

Control Techniques Guidelines: Industrial Cleaning Solvents (2006 CTG):

USEPA issued a CTG for industrial cleaning solvents in 2006 that includes recommended control techniques. This category includes the industrial cleaning solvents used by many industries. It includes a variety of products that are used to remove contaminants such as adhesives, inks, paint, dirt, soil, oil and grease. The recommended measures for controlling VOC emissions from the use, storage and disposal of industrial cleaning solvents includes work practice standards, limitations on VOC content of the cleaning materials, and an optional alternative limit on composite vapor pressure of the cleaning materials. They also include the use of add-on controls with an overall emission reduction of at least 85 percent by mass. The first two recommendations and the last one are based on the Bay Area AQMD rule.

The NJDEP proposed new rules at N.J.A.C. 7:27-16.24 on January 3, 2017. The final rules were effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the USEPA CTG, which specifies VOC content and vapor pressure limits for solvents used in solvent cleaning activities conducted to remove material through wiping, flushing, or spraying. Facilities can be exempt based on annual industrial cleaning solvent usage and source operation type. Compliance can be achieved by meeting a maximum VOC content, a maximum VOC composite vapor pressure, or a minimum control efficiency. Applicable facilities must implement best management practices, which include keeping cleaning materials in closed containers when not in use. Recordkeeping must be maintained which demonstrates compliance.

Control Technique Guidelines: Misc. Metal and Plastic Parts Coatings (2008 CTG):

In the 2008 USEPA CTG for miscellaneous metal and plastic parts coatings three options were recommended for controlling VOC emissions: (1) VOC content limits for each coating category based on the use of low-VOC content coatings and specified application methods to achieve good transfer efficiency; (2) equivalent VOC emission rate limits based on the use of a combination of low-VOC coatings, specified application methods, and add-on controls; or (3) an overall VOC control efficiency of 90 percent for facilities that choose to use add-on controls instead of low-VOC Content coatings and specified application methods. In addition, USEPA recommended work practices to further reduce VOC emissions from coatings as well as to minimize emissions from cleaning materials used in miscellaneous metal product and plastic part surface coating processes. The recommendations in this CTG are similar to the South Coast regulations governing miscellaneous metal product and plastic part surface coating operations, and Michigan Rule 336.1632.

The NJDEP proposed new rules at N.J.A.C. 7:27-16.15 on January 3, 2017. The final rules were effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the USEPA CTG, which specify an applicability limit of 2.7 tons of actual VOC emissions during any consecutive 12-month period from all miscellaneous metal and plastic part coating operations, including related cleaning activities. Compliance can be achieved by either meeting the maximum allowable VOC content, achieving a minimum 90 percent overall control efficiency, or meeting a minimum overall control efficiency which is based upon the characteristics of the coating. Exemptions include surface coating operations that exclusively use powder coating and metal part coatings which must comply with a military specification that has been formulated to meet a higher, less stringent VOC content. Applicable facilities must implement best management practices, which include keeping cleaning materials in closed containers when not in use. Recordkeeping must be maintained which demonstrates compliance.

Control Technique Guidelines: Paper, Film, and Foil Coatings (2007 CTG):

USEPA issued a 2007 CTG for paper, film and foil coatings. Previous Federal actions that affected this source category included a 1977 CTG for controlling VOC emissions from surface coating of paper, the 1983 new source performance standards (NSPS) for surface coating of pressure sensitive tape and labels (a subset of this category), and a 2002 NESHAP for paper and other web coating. USEPA recommends applying the control recommendations for coatings only to individual paper, film and foil surface coating lines with the potential to emit at least 25 tpy of VOC from coatings, prior to controls. USEPA recommends an overall VOC control efficiency of 90 percent as RACT for each coating line. This level of control is based on current rules in San Diego and Ventura air districts in California, as well as the NSPS. The CTG does not recommend the 95 percent control level that is currently required by the NESHAP and seven State's regulations.

The NJDEP proposed amendments to N.J.A.C. 7:27-16.7 on January 3, 2017. The final rules were effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the CTG, which requires paper, film, and foil coating operations to implement best management practices if the actual VOC emissions exceed 15 pounds per day for all coating operations.

Permitting/Nonattainment New Source Review (NNSR):

The CAA Section 173(a)(2) requires new or modified major sources to install the Lowest Achievable Emission Rate (LAER) control equipment. In addition, CAA Section 173(c) requires new or modified major stationary sources to obtain equal or greater emission offsets in order to operate in a nonattainment area. Thus, the LAER and offset provisions of the NNSR program provides for continual emission reductions to help improve the air quality in the nonattainment area and further downwind. In New Jersey, any new, reconstructed, or modified significant

source is also required to install state of the art (SOTA) control technology. SOTA, pursuant to New Jersey's minor NSR program at N.J.A.C. 7:27-8, also provides for emission reductions from the facilities. New Jersey's SOTA requirements, referred to in the New Jersey Air Pollution Control Act as "advances in the art of air pollution control," mandate best available control technology (BACT) if the equipment or control apparatus is subject to the Prevention of Significant Deterioration (PSD) regulation 40 CFR 52.21 or LAER if the equipment or control apparatus is subject to the Nonattainment New Source Review (NNSR) regulations N.J.A.C. 7:27-18.

Stationary Natural Gas Compressor Turbines and Engines:

At N.J.A.C. 7:27-19.5, NJDEP adopted new standards for NO_x emissions from existing simple cycle combustion turbines combusting natural gas compressing gaseous fuel at major NO_x facilities (compressor turbines). At N.J.A.C. 7:27-19.8, NJDEP adopted new standards for NO_x emissions from stationary reciprocating engines combusting natural gas and compressing gaseous fuel at major NO_x facilities (compressor engines). These rules address NO_x RACT requirements by establishing new limits on NO_x emissions from existing simple cycle combustion turbines combusting natural gas and compressing gaseous fuel at major NO_x facilities (compressor turbines) and stationary reciprocating engines combusting natural gas and compressing gaseous fuel at major NO_x facilities (compressor engines). On January 3, 2017, NJDEP proposed amendments to its rules for stationary gas turbines and engines. The final rules were effective November 6, 2017 (49 N.J.R. 3518.) The effective date of the NO_x emission benefits is November 6, 2019.

State Rules: Point Sources

Electric Generating Units (EGUs) Administrative Consent Order (ACO) B.L. England:

On January 24, 2006, an ACO was signed with B.L.England to reduce air pollutants from its EGUs. The ACO was amended on October 31, 2006, January 13, 2010, and May 18, 2012. Under the ACO agreement, B.L. England initially reduced air pollutants by shutting down one of its coal-fired units (Unit 1) since 2013. It was anticipated that B.L. England would convert its coal fired units to natural gas and was included that way in the attainment modeling. Rather than convert the remaining units, B.L. England ceased operation of all units by May 1, 2019. Their permit was terminated December 3, 2019.

EGU Rule, Coal, Oil and Gas Fired Boilers:

In addition to NJDEP's mercury rule at N.J.A.C. 7:27-27.7(d), which reduced multiple pollutants from EGUs, the NJDEP adopted amendments to N.J.A.C. 7:27-4.2 and 7:27-10.2 on April 20, 2009, which set performance standards to reduce allowable NO_x, SO_2 and particulate emissions from all ten coal-fired boilers in New Jersey. The NJDEP required compliance by 2012 (2013, if the Department grants a one year extension due to a demonstrated need). The NJDEP also adopted amendments to 7:27-19.4, on April 20, 2009, which set performance standards for NO_x emissions for gas and oil-fired boilers serving EGUs.

EGU Rule, High Electrical Demand Day (HEDD) Units:

The NJDEP adopted amendments to N.J.A.C. 7:27-19.5, on April 20, 2009, which set performance standards to reduce NO_x emissions from EGUs that primarily operate on HEDDs. On these high electric demand days, increased power generation is needed, usually on short notice. In Connecticut, Delaware, Maryland and Pennsylvania, boilers and turbines that primarily run to follow electrical load needs supply HEDD power generation. In New Jersey and New York, combustion turbines primarily supply HEDD power generation. The majority of the HEDD units in these six states were not controlled and produced significant NO_x emissions on

HEDDs. For example, on a typical summer day (June 4, 2005), NO_x emissions for the six states for all Electric Generating Units (EGUs) were 551 tons per day (tpd). On a HEDD (July 26, 2005), NO_x emissions were 1,349 tpd. Most of this increase in emissions was due to power production from uncontrolled HEDD units.

The New Jersey rule Phase 1 was effective April 20, 2009, and reduced NO_x emissions by approximately 19.8 tpd on these high electrical demand days. Specifically, power generators in New Jersey were responsible for securing these reductions and were required to submit a plan on how they would reduce NO_x. The New Jersey rule Phase 2 was effective May 1, 2015, and required that all HEDD units meet performance standards that reflect modern low NO_x. Many of the existing units in New Jersey shut down if they were not able to meet these standards.

Glass Manufacturing:

The NJDEP adopted amendments to N.J.A.C. 7:27-19.10, on April 20, 2009, which set performance standards to reduce NO_x emissions from glass manufacturing facilities. The glass manufacturing process requires that raw materials, such as sand, limestone, soda ash, and cullet (scrap and recycled glass), be fed into a furnace at temperatures between 2,700 degrees Fahrenheit to 3,100 degrees Fahrenheit. The raw materials then chemically react creating the molten material known as glass. The main product types are flat glass, container glass, pressed and blown glass, and fiberglass. The reaction of nitrogen and oxygen in the furnace creates NO_x emissions.

New Jersey's rules prior to the amendments specified NO_x emission limits for a glass manufacturing furnace used to produce a container-type glass of 5.5 pounds (lbs) NO_x per ton of pulled glass and 11 lbs NO_x per ton of pulled glass for specialty container glass.[65] Pulled glass is the total output from the furnace and includes the glass produced, including the rejected glass. New Jersey's rules prior to the amendments did not specify a NO_x emissions limit for a glass manufacturing furnace used to produce flat glass.

New Jersey's adopted amendments require the NO_x emission rates to reduce emissions consistent with the installation of oxy-fuel firing at the time of the next furnace re-build. Although several alternative NO_x control technologies exist, including combustion modifications (low NO_x burners, oxy-fuel firing, oxygen-enriched air staging), process modifications (fuel switching, batch preheat, electric boost), and post combustion modifications (fuel reburn, SNCR, SCR), oxy-fuel firing is consider the most effective because it not only reduces NO_x emissions by as much as 85 percent, but also reduces energy consumption, increases production rates by 10-15 percent, and improves glass quality by reducing defects. In addition, oxy-fuel firing is demonstrated technology and has penetrated all segments of the glass industry.

Petroleum Storage:

The NJDEP adopted amendments to N.J.A.C. 7:27-16.2, on April 20, 2009, which established requirements to reduce VOC emissions from bulk petroleum storage facilities. Some petroleum and VOC products are stored in large storage tanks that are capped with floating roofs. Evaporative VOC emissions from floating roof tanks are the result of standing storage and working losses. Standing storage losses are evaporative losses through rim seals, deck fittings, and or deck seams. Floating roof storage tanks move vertically on slotted guide pole legs. VOCs escape from gaps at the juncture of the roof and legs. Working losses, including landing

[65] "Specialty container glass" means clear or colored glass made of soda-lime recipe, which is produced to meet the specifications of any standard set forth by The United States Pharmacopeia or The National Formulary, and which is used for pharmaceutical, cosmetic or scientific purposes.

losses,[66] are due to changes in the stored liquid levels due to filling and draining operations. There are several control techniques now available to limit emissions due to standing storage and working losses including vapor recovery systems, retrofitting slotted guide poles with covers or sleeves, retrofitting to domed roof, and lower landing heights.

New Jersey's amendments include the following:

- Cover or dome external floating roof tanks;
- Implement measures to reduce VOC emissions emitted during degassing, cleaning, and landing operations, and from slotted guide poles;
- Apply to existing tanks the NSPS for floating roof seal and deck fitting specifications; and tank preventive inspection and maintenance requirements.

State Rules: Area Sources

Portable Fuel Containers (PFCs):

The NJDEP adopted amendments to N.J.A.C. 7:27-24, on May 3, 2004, and December 1, 2008, which regulate VOC emissions from PFCs. PFCs are designed for transporting and storing fuel from a retail distribution to a point of use and the eventual dispensing of the fuel into equipment. Commonly referred to as "gas cans," these products come in a variety of shapes and sizes with nominal capacities ranging in size from less than one gallon to over six gallons. VOC emissions from PFCs are classified by five different activities: transport-spillage, diurnal emissions, permeation, and equipment refueling vapor displacement and spillage emissions. Diurnal evaporative emissions are the largest category. Diurnal evaporative emissions are evaporative emissions resulting from the daily cycling of ambient temperatures.

Specifically, the New Jersey rule contains requirements that address VOC emissions from PFCs, effective January 1, 2005, and 2009. The rule requires that PFCs and/or spouts be equipped with an automatic shut-off device, an automatic device that closes and seals when it is removed from the fuel tank and sets a permeability limit. The rule also requires that a PFC has a fuel flow rate and fill level standards. The USEPA promulgated a similar Federal rule with an effective date of January 1, 2009.

State Rules: Onroad Mobile Sources

IM: Diesel Smoke Cutpoint:

The NJDEP adopted amendments to N.J.A.C. 7:27 - 14.2, 14.4, 14.6, and 7:27B - 4.5 on April 3, 2009, which reduce the allowable smoke from heavy-duty diesel vehicles during inspections. Smoke opacity, which is used as a surrogate for particulate matter, is the degree to which a plume of smoke will obstruct transmission of visible light. Newer trucks are equipped with emission control equipment which reduces the exhaust emissions. Smoke opacity is an indicator that maintenance is needed.

IM: Heavy Duty OBD:

The NJDEP adopted amendments to N.J.A.C. 7:27 – 14, 15, and N.J.A.C. 7:27B-4, B-5 on September 9, 2016, which added on-board diagnostic (OBD) inspection and maintenance requirements for heavy duty vehicles. OBD equipment monitors the status of vehicle emission

[66] "Landing losses" refer to emissions that occur from floating-roof tanks whenever the tank is drained to a level where its roof rests on its deck legs (or other supports).

controls and engine performance, alerting the driver via a dashboard indicator if there is a vehicle malfunction. The rules require heavy duty vehicles with OBD systems installed, model years 2014 and newer, to pass an OBD inspection every year for commercial vehicles and every two years for passenger vehicles. The estimated start date of the program is in 2026.

New Jersey Low Emission Vehicle Program:

The NJDEP's Low Emission Vehicle (LEV) program (or Clean Car Program) rule was adopted on November 28, 2005, with an operative date of January 27, 2006.[67] The rule requires all new vehicles offered for sale in New Jersey to be California certified for emissions beginning January 1, 2009. This rule also establishes a zero-emission vehicle (ZEV) sales requirement for New Jersey and requires that each auto manufacturer's sales fleet in New Jersey meet a declining fleet average non-methane organic gas (NMOG) emission standard.

State Voluntary Mobile Measures

Emission reduction estimates in this section are for illustrative purposes only and are not being relied on to meet any required SIP milestones.

Transportation Control Measures (TCMs)

An important class of mobile source control measures that States are authorized to implement is Transportation Control Measures (TCMs). TCMs are transportation strategies, specific to mobile sources, which reduce emissions by reducing the number and/or length of vehicle trips and/or improve traffic flow. After the passage of the CAA Amendments of 1990, New Jersey made a full-scale commitment to TCMs. To this day New Jersey's transportation capital program continues to stress transit projects, system preservation, and systems management over the provision of new highway capacity. The NJDOT has continued to commit to the support and implementation of air quality-friendly transportation projects and programs.

Transportation Management Associations (TMAs) are non-profit organizations that work with businesses, commuters, county and local governments, and state agencies to implement programs that reduce traffic congestion and improve air quality. There are eight TMAs currently operating in the state of New Jersey. Seven TMAs operate in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area. They are: EZRide (Meadowlink), TransOptions, Ridewise of Raritan Valley, Keep Middlesex Moving, HART Commuter Information Services, Greater Mercer TMA and Hudson TMA. The eighth TMA is the Cross County Connection. TMAs carefully apply selected approaches to facilitating the movement of people and goods within an area. NJTPA coordinates the activities of the TMAs within the NJTPA region. In New Jersey, many TCMs are organized and operated by the TMAs with additional assistance from NJTPA on more encompassing projects (such as ride match services.) Details on these TCM programs are available on the web sites for each of the TMAs.

North Jersey Transportation Planning Authority Transportation Clean Air Measures

The purpose of this competitive program is to advance readily implementable and innovative projects and services that improve air quality and reduce congestion in the NJTPA's air quality maintenance and non-attainment areas. Eligible program activities fall under two categories: Local Mobility Initiatives (Shuttle Services) and Transportation Clean Air Measures (TCAMs). Examples of TCAM funded projects include:

[67] 38 N.J.R. 497(b) (January 17, 2006).

- NJ Transit Locomotive Idle Reduction Program – Greater than $350k project that resulted in reductions of VOCs, NO_x, PM2.5 and GHGs.
- Port Authority of New York New Jersey (PANYNJ)/CSX Railroad Project – A $3M diesel freight locomotive retrofit/replacement program.
- NJ Diesel Modernization Program – See description below.
- Truck Replacement Program – See description below.

Truck Replacement Program

The North Jersey Regional Truck Replacement Program will continue to make grant incentives available to assist private truck owners in the replacement of their old, high-emissions trucks with newer fuel-efficient vehicles because of recent grants from the USEPA. Sponsored by the Port Authority of New York & New Jersey (PANYNJ), this private/public partnership with independent truck owner-operators, has replaced numerous trucks from the 1994-1995 model year. The program was initially funded by $13.7 M of CMAQ grants; however, the program was put on hold in 2017 by a presidential "Buy-America" Executive Order (EO) that made the program implementation infeasible. The USEPA's $2 M grant, not subject to the EO, was awarded in February 2019. This added to a previous USEPA grant of $1.75 M. The program pays the owners of trucks with aging engines up to $25,000 to assist them in paying the cost to replace them with 2007-or-newer engines. The USEPA grants to PANYNJ since 2017 have been replacing older trucks with trucks that meet USEPA's 2010 heavy duty engine standards. With the USEPA grants it is estimated that it will be possible to remove all trucks with engines made in 1994 and 1995 from the port and some from 1996.

NJ Diesel Modernization Program

The New Jersey Diesel Modernization Program is implemented by the NJDEP. The New Jersey Diesel Modernization Program provides funding for the modernization of off-road construction equipment, which provides reductions in particulate matter, VOC and NO_x emissions. Grant money is used to aid in the purchasing of replacement equipment (up to 30 percent of a new diesel purchase or up to 40% for new electric). The New Jersey Diesel Modernization Program prioritizes projects by construction equipment used on projects that are conducted in urban/sensitive areas; construction equipment with the highest use; and older construction equipment. Replacing older equipment with equipment that meets USEPA's Tier 4 standards will achieve approximately 27 tons of NO_x and 1.6 tons of VOC over 20 years starting in 2018. Emissions benefits for the vehicle replacements were calculated using the USEPA Diesel Emission Quantifier (DEQ).

Marine Ferry Repower Program

The Marine Repower Program focuses on replacing older marine diesel engines with new cleaner versions that operate more efficiently and have lower emissions. Marine engines remain in service for far longer than their estimated useful life, which makes it necessary for repower programs to ensure emission reductions. Repowering the marine engines to Tier 3 or Tier 4 when appropriate will achieve lifetime benefits of approximately 2000 tons of NO_x and 100 tons of PM. In addition, more efficient, higher-powered engines reduce fuel consumption by approximately 10%. The program will integrate hybrid repowers or new hybrid or fully electric replacements as technology advances.

PA-NY-NJ Cargo Handling Equipment for Port Authority

A Fleet Modernization and Replacement Program for Cargo Handling Equipment is intended to replace yard equipment that serves the Port Authority's marine terminals located in Essex and

Union counties with new cleaner-burning equipment. This project is sponsored by the Port Authority of New York & New Jersey and was funded by a $2 million federal Congestion Mitigation Air Quality (CMAQ) grant. It incentivizes port tenants to replace their older fleet with new equipment with Tier IV engines or alternative powered equipment, including all electric, diesel electric or hydraulic hybrids, and liquefied or compressed natural gas. Successful applicants can get reimbursed 20% of the purchase price, up to $20,000 per unit replaced. Old equipment must be scrapped.

Idle Reduction Program

The Idle Reduction Program focuses on refrigerated diesel trucks that spend excessive amounts of time idling to keep the truck's contents cool or frozen. This program focuses on electrifying parking spaces at warehouses or distribution centers and retrofitting the diesel auxiliary engines so they can be plugged in during loading and unloading or while remaining stationary. Estimated annual benefits in the North Jersey Transportation Planning Authority Planning area are estimated to be 50 tons of NO_x and 12 tons of PM. Additional benefits are the decreased noise levels of 5 to 6 decibels when transitioning from diesel to electric.

Nonroad Mobile Measures in Southern NJ-PA-DE-MD Nonattainment Area:

Forklift Replacements:

The South Jersey Port Corporation (SJPC), in Camden County, New Jersey, an agency of the State of New Jersey, operates and maintains two of the port terminals in this area. Cargo handling equipment, such as forklifts, are essential in the day-to-day operation of the marine terminals along the Delaware River. These forklifts work many hours to keep the cargo moving between ship, rail and highway. SJPC replaced nine of their oldest (31 to 55 years old), highest-use forklifts with new Tier 4 engine forklifts. The new equipment will have a minimum useful life of 20 years, though it is expected that the equipment will be in use for many more years. The project emission benefits are: 56 tons of PM, 108 tons of NO_x, 18 tons of hydrocarbons, and 197 tons of carbon monoxide in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area. These benefits were calculated with the USEPA Diesel Emissions Quantifier.

EMS Idle Reduction Program:

This program is a pilot program that will focus on ambulances that spend significant time periods in an idling mode of operation. These vehicles idle to ensure that medicine and oxygen kept onboard remain at a constant, cool temperature. The program will provide funding to install small, auxiliary power units that will aid in climate control for the vital contents onboard without having to run the vehicle's larger diesel engine. These vehicles idle in residential neighborhoods most of the day. The small amount of funding is projected to install 17 units on ambulances with an estimated annual emission benefit of 62 lbs of NO_x and 5 lbs of PM.

USEPA Diesel Emission Reduction Act (DERA)

- Non-road Retrofit and Replacements

  USEPA allows for up to 25% of funding, not to exceed $100,000 per piece of equipment, to replace old diesel non-road equipment with new Tier 4 equipment or 100% the cost of installation of a diesel retrofit device. This funding is estimated to cover 1 retrofit and 6

equipment replacements with a lifetime estimated statewide benefit of 62 tons of NO_x and 15 tons of PM.

- USEPA allows for up to 45% of funding of a new electric non-road vehicle and up to 30% of funding for the electric vehicle charging station. This funding is estimated to cover 17 equipment replacements and 17 electric vehicle charging stations with a lifetime estimated statewide benefit of 16 tons of NO_x and1 ton of PM.

- USEPA allows for up to 45% of funding for zero emission powered eTRUs and up to 30% of funding for electrified parking space technology. This funding is estimated to cover 30 equipment replacements and 30 electric vehicle charging stations with a lifetime estimated statewide benefit of 121 tons of NO_x and 28 tons of PM.

- Marine Repowers

  USEPA allows for up to 40% of funding towards the cost of a repowered marine diesel engine to Tier 3 or better. Marine vessels operate much longer than their estimated useful life therefore funding provides an opportunity for quicker turnover to cleaner and more efficient engines. Funding is estimated to repower 6 vessels with estimated annual benefits of 47 tons of NO_x and 0.3 tons of PM.

Electric Vehicles

New Jersey is supportive of the roll-out of Electric Vehicle (EV) support infrastructure and seeks to encourage greater adoption of EVs statewide. NJDEP is prioritizing transportation initiatives that reduce emissions and associated health impacts in communities disproportionally impacted by pollution.

In place since 2016, NJDEP's grant program for electric vehicle charging stations, It Pay$ To Plug In, has allocated more than $13 million for electric vehicle charging station grants. NJDEP has also conducted 16 electric vehicle ride-and-drive events with over 1,000 EV test drives, and actively participates in the regional Drive Change. Drive Electric campaign to help raise consumer awareness about the benefits of clean vehicles.

Additional new measures are discussed in Section 3.5

Federal Rules: Point and Area Sources

Boiler/Process Heater NESHAP:

The Federal Industrial/Commercial/Institutional (ICI) Boilers and Process Heaters NESHAP rule promulgates national emission standards for the control of hazardous air pollutants (HAP) for new and existing industrial, commercial, and institutional (ICI) boilers and process heaters at major HAPs sources. The final rule was published in the Federal Register in January 2013 and requires existing major sources to comply with the standards by January 2016. In addition, there is an area source Boiler NESHAP rule that requires tune-ups for smaller boilers. It is expected that many boilers that burn coal or oil will be replaced by new natural gas boilers because of the rule. The expected co-benefit for criteria air pollutants at these facilities is expected to be significant.

New Jersey adopted amendments to rules regulating boilers on October 17, 2005, and on April 20, 2009, at N.J.A.C. 7:27-19.7. The amendments revised the NO_x emission limits for both point and area source ICI boilers and required boiler tune-ups for point and area source boilers.

Under the amendments, owners and operators of any ICI boilers as small as 25 MMBtu/hr would be required to achieve emission limits specified in the rules and boilers greater than 5 MMBtu/hr are required to have annual tune-ups.

Due to New Jersey already having stringent boiler rules in place prior to 2011, minimal reductions are expected from the Federal rule in New Jersey after 2011.

Natural Gas Turbine NSPS:

The NSPS for stationary combustion turbines are outlined in the Code of Federal Regulations under 40 CFR Part 60 Subparts GG and KKKK. Subpart GG covers turbine engines that commenced constructed after October 3, 1977, and before February 18, 2005. Subpart KKKK covers both the combustion turbine engine and any associated heat recovery steam generator for units that commenced construction after February 18, 2005. The key pollutants USEPA regulates from these sources include NO_x and sulfur dioxide (SO_2).

In 2006, USEPA promulgated standards of performance for new stationary combustion turbines in 40 CFR subpart KKKK. The standards reflect changes in NO_x emission control technologies and turbine design since standards for these units were originally promulgated in 40 CFR part 60, subpart GG. The 2006 NSPSs affecting NO_x and SO_2 were established at levels that bring the emission limits up to date with the performance of current combustion turbines. Stationary combustion turbines were also regulated by the NO_x SIP Call, which required affected gas turbines to reduce their NO_x emissions by 60 percent.

On August 29, 2012, USEPA proposed to amend the NSPS for stationary gas turbines (40 CFR 60 Subpart GG) and stationary combustion turbines (40 CFR 60 Subpart KKKK) in response to a petition for reconsideration. The proposed amendments are intended to clarify the intent in applying and implementing specific rule requirements. Those affected by this proposed rule include owners or operators of stationary combustion turbines on which construction, modification or reconstruction began after 18 February 2005 and that have a base load rating equal to or greater than 2.9 megawatts (MW) (10 million British thermal units per hour [MMBtu/h]). The proposed amendments would increase the environmental benefits of the existing requirements because the emission standards would apply at all times. The proposed amendments would also promote efficiency by recognizing the environmental benefit of combined heat and power and the beneficial use of low energy content gases.

Reciprocating Internal Combustion Engine (RICE) NSPS:

The CAA requires USEPA to set NSPS for stationary internal combustion engines, which are generally diesel engines. The standards must consider available emission control technologies and costs of control. On July 11, 2006, USEPA issued standards of performance for stationary reciprocating internal combustion engines. These engines are used at facilities such as power plants and chemical and manufacturing plants, to generate electricity and to power pumps and compressors. They are also used in emergencies to produce electricity and to pump water for flood and fire control. The final standards, limited emissions of NO_x, PM, SO_2, CO, and hydrocarbons (HC) from stationary RICE to the same stringent levels required by USEPA's nonroad diesel engine regulations. The final rule also limited the amount of sulfur in the diesel fuel used to run these engines.

In June 2011, USEPA amended the standards to align emission limits for certain categories of stationary internal combustion engines with similar sized engines used in marine applications. These amendments are effective in 2016.

RICE NESHAP:

USEPA developed control factors for three NESHAP rulemakings for RICE. These rules reduce HAPs from existing and new RICE sources. In order to meet the standards, existing sources with certain types of engines will need to install controls. In addition to reducing HAPs, these controls have co-benefits that also reduce CAPs, specifically, CO, NO_x, VOC, PM, and SO_2. The RICE NESHAP rules apply to both point and area sources. These rules are effective in 2017.

Petroleum Refineries NSPS Subpart JA

On June 24, 2008, USEPA issued final amendments to the Standards of Performance for Petroleum Refineries. This action also promulgated separate standards of performance for new, modified, or reconstructed process units after May 14, 2007, at petroleum refineries. The final standards for new process units included emissions limitations and work practice standards for fluid catalytic cracking units, fluid coking units, delayed coking units, fuel gas combustion devices, and sulfur recovery plants. In 2012, USEPA finalized the rule after some amendments and technical corrections. See https://www.epa.gov/stationary-sources-air-pollution/petroleum-refineries-new-source-performance-standards-nsps-40-cfr for more details on NSPS – 40 CFR 60 Subpart Ja.

Federal Rules: Point Sources

EGUs: CSAPR and Transport Rules:

On July 6, 2011, the USEPA finalized the Cross-State Air Pollution Rule (CSAPR) to address air pollution from upwind states that crosses state lines and affects air quality in downwind states. This rule requires certain states in the eastern half of the U.S. to improve air quality by reducing power plant emissions that cross state lines and contribute to smog and soot pollution in downwind states. The CSAPR replaced USEPA's 2005 Clean Air Interstate Rule (CAIR), following the direction of a 2008 court decision that required USEPA to issue a replacement regulation. Several amendments to the rule followed. On June 5, 2023, the USEPA published its final Good Neighbor Plan entitled "Federal 'Good Neighbor Plan' for the 2015 Ozone National Ambient Air Quality Standards" effective August 4, 2023, which secures reductions in ozone-forming emissions of NO_x from power plants and industrial facilities. The CSAPR and Transport rules are discussed in detail in Chapter 8.

EGUs: Mercury and Air Toxics Standards:

On December 16, 2011, the USEPA promulgated the Mercury and Air Toxics Standards (MATS) to reduce emissions of toxic pollutants from power plants. The MATS are national CAA standards to reduce mercury and other toxic emissions from new and existing coal- and oil-fired electric utility steam generating units (EGUs). The standards reduced emissions of metals, including mercury (Hg), arsenic (As), chromium (Cr) and nickel (Ni), acid gases, including hydrogen chloride (HCl) and hydrogen fluoride (HF). Emission controls to reduce air toxics also reduce emissions of PM2.5 and SO2. The MATS rule included revisions to the Federal NSPS for new fossil fuel-fired electric generating units, including revised numerical emission limits for PM, SO2, and NOx.

Combined with other changes affecting the power sector, MATS has driven sharp reductions in harmful air toxic pollutants from coal- and oil-fired power plants. Industry reported emissions data, required by MATS, shows 2021 mercury emissions from coal-fired EGUs were 90 percent lower than pre-MATS levels. Since 2010, acid gas HAP emissions have been reduced by over 96 percent and emissions of the non-mercury metals, including nickel, arsenic, and lead, have been reduced by more than 81 percent.

On May 22, 2020, the USEPA published in the Federal Register a reconsideration of the appropriate and necessary finding for the MATS and a revision of the residual risk and technology review that is required by CAA Section 112. On February 15, 2023, the USEPA completely revoked its earlier 2020 finding that it was not appropriate and necessary to regulate coal- and oil-fired power plants under CAA section 112. Also, the USEPA reviewed the 2020 action and considered updated information on both the public health burden associated with HAP emissions from coal- and oil-fired power plants as well as the costs associated with reducing those emissions under the MATS.

On April 25, 2024, the USEPA announced final requirements to strengthen and update the MATS for power plants, based on an evaluation of the residual risk and technology review. This final rule reflects the most significant improvements and updates to MATS since EPA first issued these standards in February 2012. It also fulfills EPA's responsibility under the CAA to periodically re-evaluate its standards in light of advancements in pollution control technologies to determine whether revisions are necessary. The USEPA projects that these final MATS standards will result in the following emissions reductions in 2028: 1,000 pounds of mercury, 770 tons of PM2.5, 280 tons of NOx, 65,000 tons of carbon dioxide (CO2), and at least 7 tons of non-mercury HAP metals.

Process Heater NSPS:

Process heaters are used throughout refineries and chemical plants to raise the temperature of feed materials to meet reaction or distillation requirements. Fuels are typically residual oil, distillate oil, refinery gas, or natural gas. In some sense, process heaters can be considered as emission control devices because they can be used to control process streams by recovering the fuel value while destroying the VOC. The criteria pollutants of most concern for process heaters are NO_x and SO_2.

In 2011, process heaters have not been subject to regional control programs like the NO_x SIP Call, so most of the emission controls installed at refineries and chemical plants have resulted from RACT regulations that were implemented as part of SIPs to achieve ozone NAAQS compliance in specific nonattainment areas, and from refinery consent decrees. The boiler/process heater NSPS established NO_x emission limits for new and modified process heaters. The boiler/process heater NSPS established NO_x emission limits for new and modified process heaters.

Refinery Consent Decrees:

The USEPA and various state and local agencies negotiated Consent Decrees with certain major refineries to elicit emission reductions from five major refinery processes. The processes are Fluid Catalytic Cracking Units (FCCUs) and Fluid Coking Units (FCUs), Process Heaters and Boilers, Flare Gas Recovery, Leak Detection and Repair (LDAR), and Benzene/Wastewater. The New Jersey refineries with settlements included Sunoco (now closed), Hess (now closed and owned by Buckeye), Valero and ConocoPhillips.

For FCCUs/FCUs, the Consent Decree control requirements generally require the installation of wet gas scrubbers for SO_2 control, and selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), or other measures to reduce NO_x emissions.

For process boilers/heaters, the control requirements for SO_2 emissions generally require the elimination of burning solids/liquid fuels. For NO_x emissions, the control requirements generally apply to units greater than 40 MMBtu per hour capacity or larger. In many cases, the Consent Decrees establish NO_x emission reduction objectives across several refineries that are owned by the same firm. Therefore, the companies decide which individual boilers/heaters to control and the control techniques to apply.

The Consent Decrees also included enhanced leak detection and repair programs (e.g., reducing the defined leak concentration) and other VOC requirements. The settlements are expected to produce additional SO_2, NO_x, and VOC emissions reductions for flare gas recovery and wastewater operations. The Consent Decrees have various phase-in dates.

Federal Rules: Area Sources

Residential Woodstove NSPS:

On February 3, 2015, the USEPA strengthened its clean air standards for residential wood heaters to make new heaters significantly cleaner and improve air quality in communities where people burn wood for heat. The updates, which are based on improved wood heater technology, strengthen the emissions standards for new woodstoves, while establishing the first ever Federal air standards for several types of previously unregulated new wood heaters, including outdoor and indoor wood-fired boilers (also known as hydronic heaters), and indoor wood-burning forced air furnaces. The rule will not affect existing wood stoves and other wood-burning heaters currently in use in people's homes.

Federal Rules: Onroad Mobile Sources

Heavy Duty Vehicle Standards and Diesel Fuel Sulfur Control:

On July 31, 2000, the USEPA issued a final rule for the first phase of its two-part strategy to significantly reduce harmful diesel emissions from heavy-duty trucks and buses. This rule finalized new diesel engine standards beginning in 2004, for all diesel vehicles over 8,500 pounds. Additional diesel standards and test procedures in this final rule began in 2007. This new rule required heavy-duty gasoline engines to meet new, more stringent standards starting no later than the 2005 model year. According to the USEPA, these new standards require gasoline trucks to emit 78 percent less NO_x and hydrocarbons, and diesel trucks to emit 40 percent less NO_x and hydrocarbons, than current models. The second phase of the program required cleaner diesel fuels and even cleaner engines, reducing air pollution from trucks and buses by another 90 percent. The USEPA issued the final rule, to take effect in 2006-2010 on January 18, 2001.

National Low Emission Vehicle Program (NLEV):

The NLEV program required automobile manufacturers to meet more stringent new car standards, starting with the 1999 model year in the OTC states and starting with the 2001 model year in the remainder of the nation except for California. New Jersey committed to participate in the NLEV Program ending with model year 2006, except as provided in 40 CFR. §86.1707. However, if by no later than December 15, 2000, the USEPA did not adopt standards at least as stringent as the NLEV standards for model years 2004, 2005 or 2006, the State's participation in NLEV would extend only until the model year 2004. The USEPA promulgated its Tier 2 new motor vehicle standards commencing with model year 2004 on February 10, 2000. These standards are more stringent than the NLEV standards provided for in 40 CFR Part 86, subpart R. As such, New Jersey's participation in the NLEV program extended through model year 2006, after which New Jersey came under the Federal Tier 2 program.

Tier 1 Vehicle Program:

Pursuant to 42 U.S.C. §7521, the USEPA promulgated regulations which revised the tailpipe/extended useful life standards of the Federal Motor Vehicle Control Program (FMVCP)

for light duty vehicles and light duty trucks.[68] These standards, known as Tier 1, were implemented in phases beginning with the 1994 model year. The Tier 1 standards encompassed pollutants previously regulated (that is, carbon monoxide, nitrogen oxides, and particulate matter), as well as the addition of non-methane hydrocarbons (NMHC). The standards themselves are a function of vehicle class, pollutant, useful life, engine cycle, and fuel. The Tier 1 rulemaking also established new intermediate and full useful life[69] levels for light-duty vehicles and light-duty trucks, as well as new vehicle weight classes. The regulation affected petroleum and methanol fueled motor vehicles.

Tier 2 Vehicle Program/Low Sulfur Fuels:

On February 10, 2000, the USEPA promulgated rules for its comprehensive Tier2/Low Sulfur Gasoline program.[70] These regulations are designed to treat a vehicle and its fuel as a system, resulting in multiple efforts to reduce highway source emissions. In addition to requiring new tailpipe emissions standards for all passenger vehicles, sport utility vehicles (SUVs), minivans, vans and pick-up trucks, the USEPA simultaneously promulgated regulations to lower the sulfur standard in gasoline. These regulations phased in between 2004 - 2007.

Tier 3 Motor Vehicle Emission and Fuel Standards:

On April 28, 2014, the USEPA promulgated Tier 3 motor vehicle emissions and fuel standards.[71] The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality and public health. The program considers the vehicle and its fuel as an integrated system, setting new vehicle emissions standards and a new gasoline sulfur standard beginning in 2017. The vehicle emissions standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The lower gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective.

GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026

On December 30, 2021, USEPA finalized federal greenhouse gas (GHG) emissions standards for new passenger cars and light trucks for Model Years (MY) 2023 through 2026. The final standards leverage advances in clean car technology to unlock $190 billion in net benefits to Americans, including reducing climate pollution, improving public health, and saving drivers money at the pump. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and are based on sound science and grounded in a rigorous assessment of current and future technologies. The updated standards will result in avoiding more than 3 billion tons of GHG emissions through 2050 with co-benefits of reducing the ozone precursors NO_x and VOCs.

Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards

On December 20, 2022, USEPA adopted a final rule, “Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards,” that sets stronger emissions standards to further reduce air pollution, including the ozone precursors NO_x and VOCs and particulate matter, from heavy-duty vehicles and engines starting in model year 2027. The final program includes more stringent emissions standards that cover a wider range of heavy-duty engine operating conditions compared to previous standards, and it requires these more stringent

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[68] 56 Fed. Reg. 25724 (June 5, 1991).
[69] Useful life is the number of years that the vehicle is expected to be in use.
[70] 65 Fed. Reg. 6698 (February 10, 2000).
[71] 79 Fed. Reg. 23414 (April 28, 2014).

emissions standards to be met for a longer period of time when these engines operate on the road.

Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-duty and Medium-Duty Vehicles

On April 12, 2023, USEPA announced a proposal for new, more ambitious proposed standards to further reduce harmful air pollutant emissions from light-duty and medium-duty vehicles starting with model year 2027. The proposal builds upon USEPA's final standards for federal greenhouse gas emissions standards for passenger cars and light trucks for model years 2023 through 2026 and leverages advances in clean car technology to unlock benefits to Americans ranging from reducing climate pollution, to improving public health, to saving drivers money through reduced fuel and maintenance costs. The proposed standards would phase in over model years 2027 through 2032. The standards will reduce GHGs, VOCs, NO_x and PM2.5. USEPA finalized the regulations on March 20, 2024.

Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3

On April 12, 2023, USEPA announced a proposal for more stringent standards to reduce greenhouse gas emissions from heavy-duty (HD) vehicles beginning in model year (MY) 2027. The new standards would be applicable to HD vocational vehicles (such as delivery trucks, refuse haulers, public utility trucks, transit, shuttle, school buses, etc.) and tractors (such as day cabs and sleeper cabs on tractor-trailer trucks). Specifically, USEPA is proposing stronger CO2 standards for MY 2027 HD vehicles that go beyond the current standards that apply under the HD Phase 2 Greenhouse Gas program. USEPA is also proposing an additional set of CO2 standards for HD vehicles that would begin to apply in MY 2028, with progressively lower standards each model year through 2032. The standards will reduce GHGs, VOCs, NO_x, PM and SO_2. USEPA finalized the regulations on April 27, 2024.

Federal Rules: Nonroad Mobile Sources

Diesel Compression Ignition Engines:

In June 1994, the USEPA promulgated regulations to control VOC, NO_x and carbon monoxide emissions from diesel-powered compression ignition engines at or greater than 50 horsepower (hp) (i.e., bulldozers).[72] These Tier 1 standards phased in from 1996 to 2000. In October 1998, the USEPA promulgated regulations to control VOC, NO_x and carbon monoxide (CO) emissions from diesel-powered compression ignition engines for all engine sizes.[73] This rule includes Tier 1 standards for engines under 50 horsepower (hp) (i.e., lawn tractors), Tier 2 standards for all engine sizes, and more stringent Tier 3 standards for engines rated over 50 hp. The new Tier 3 standards are expected to lead to control technologies similar to those that will be used by manufacturers of highway heavy-duty engines to comply with the 2004 highway engines standards.[74] The new Tier 1 standards were phased in between the years 1999 and 2000, Tier 2 standards between 2001 and 2006, Tier 3 between 2006 and 2008, and Tier 4 standards between 2011 and 2015.

[72] 59 Fed. Reg. 31306 (June 17, 1994).
[73] 63 Fed. Reg. 56968 (October 23, 1998).
[74] USEPA. Regulatory Announcement: New Emission Standards for Nonroad Diesel Engines. United States Environmental Protection Agency Office of Mobile Sources, EPA420-F-98-034, August 1998.

Diesel Marine Engines over 37 KW (Commercial Marine Engines) :

In December 1999, the USEPA promulgated regulations for commercial marine diesel engines over 37 kilowatts (kW), including engines with per cylinder displacement up to 30 liters.[75] This rule established VOC and NO_x emission standards, starting in 2004, for new engines with per cylinder displacement up to 2.5 liters. This rule also established standards in 2007 for engines with per cylinder displacement between 2.5 and 30 liters.[76] The engines covered by this rule are divided into two categories: Category 1: rated power at or above 37 kW - specific displacement of less than 5 liters per cylinder. These engines are primarily found in fast ferries. Category 2: rated power at or above 37 kW - specific displacement greater than or equal to 5, but less than 30 liters per cylinder. These engines are primarily found in tug and towboats.
In February 2003, the USEPA promulgated regulations for commercial marine diesel engines at or above 30 liters per cylinder.[77] This rule established Tier 1 NO_x emission standards to meet the International Maritime Organization (IMO) Annex VI to the International Convention for the Prevention of Pollution from ships (also called MARPOL) requirements for Category 3 marine diesel engines. These standards apply to new Category 3 marine diesel engines manufactured January 1, 2004, or later. These engines range in size from about 2,500 to 70,000 kilowatts (3,000 to 100,000 horsepower). These are very large marine diesel engines used for propulsion power on ocean-going vessels such as container ships, oil tankers, bulk carriers, and cruise ships.

On April 30, 2010, the USEPA adopted new standards to regulate new Category 3 marine diesel engines which are equivalent to the current MARPOL ANNEX VI standards.[78] These standards add two new tiers of NO_x emission standards and fuel sulfur limits. The Tier 2 standards will begin in 2011 and the Tier 3 standards will begin in 2016. Also, new fuel requirements will generally forbid the production and sale of other fuels above 1,000 ppm sulfur for use in most U.S. waters.

Large Industrial Spark-Ignition Engines over 19 kilowatts:

Spark-ignition nonroad engines are mostly powered by liquefied petroleum gas, with others operating on gasoline or compressed natural gas. These engines are used in commercial and industrial applications, including forklifts, electric generators, airport baggage transport vehicles, and a variety of farm and construction applications.

On November 8, 2002, the USEPA adopted new standards to regulate these engines.[79] The emission standards are two-tiered. The Tier 1 standards, which started in 2004, are based on a simple laboratory measurement using steady-state procedures. The Tier 2 standards starting in 2007 are based on transient testing in the laboratory, which ensures that the engines will control emissions when they operate under changing speeds and loads in the different kinds of equipment.

Also included is an option for manufacturers to certify their engines to different emission levels to reflect the fact that decreasing NO_x emissions tend to increase carbon monoxide emissions (and vice versa). In addition to these exhaust-emission controls, manufacturers must take steps starting in 2007 to reduce evaporative emissions, such as using pressurized fuel tanks. Tier 2

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[75] 64 Fed. Reg. 73300 (December 29, 1999).
[76] USEPA. Technical Highlights: Organization of Gasoline and Diesel Marine Engine Emission Standards. United States Environmental Protection Agency Office of Mobile Sources, EPA420-F-99-046. December 1999.
[77] 68 Fed. Reg. 9746 (February 28, 2003).
[78] 75 Fed. Reg. 22896 (April 30, 2010).
[79] 67 Fed. Reg. 68241 (November 8, 2002).

engines are also required to have engine diagnostic capabilities that alert the operator to malfunctions in the engine's emission-control system. Finally, the rule also includes special standards to allow for measuring emissions without removing engines from equipment.

Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder:

In April 1998, the USEPA adopted three sets of emission standards for locomotives, with applicability of the standards dependent on the date a locomotive is first manufactured.[80] The first set of standards (Tier 0) applies to locomotives and locomotive engines originally manufactured from 1973 through 2001, any time they are manufactured or remanufactured. The second set of standards (Tier 1) applies to locomotives and locomotive engines originally manufactured from 2002 through 2004. These locomotives and locomotive engines will be required to meet the Tier 1 standards at the time of original manufacture and at each subsequent remanufacture. The final set of standards (Tier 2) applies to locomotives and locomotive engines originally manufactured in 2005 and later. Tier 2 locomotives and locomotive engines will be required to meet the applicable standards at the time of original manufacture and at each subsequent remanufacture.

On June 30, 2008, the USEPA adopted more stringent exhaust emission standards for locomotives and marine diesel engines less than 30 liters per Cylinder.[81] The standards include: tightening emission standards for existing locomotives and marine vessels when they are remanufactured; setting near-term engine-out emission standards (Tier 3 standards) for newly-built locomotives and marine diesel engines; and setting longer-term standards (Tier 4 standards) for newly-built locomotives and marine diesel engines that reflect the application of high-efficiency after treatment technology. The USEPA is also proposing provisions to eliminate emissions from unnecessary locomotive idling.

The standards for remanufactured locomotives and marine vessels will take effect as soon as certified remanufacture systems are available (as early as 2008). Tier 3 standards for newly built locomotive and marine engines would phase in starting in 2009. Tier 4 standards for newly built locomotives and marine diesel engines would phase in beginning in 2014 for marine diesel engines and 2015 for locomotives.

Recreational Vehicles: Recreational vehicles include snowmobiles, off-highway motorcycles, and all-terrain-vehicles (ATVs). In November 2002, the USEPA adopted new standards to regulate nonroad recreational engines and vehicles.[82] These new engine standards were phased in from 2006 through 2012.

Spark Ignition Engines, Equipment, and Vessels at or below 19 kW (Lawn and Garden and Small Watercraft):

In July 1995, the USEPA promulgated the first phase of its regulations to control emissions from most new handheld and nonhandheld nonroad spark ignition engines that have a gross power output at or below 19 kilowatts.[83] This regulation established VOC and carbon monoxide emission standards beginning in model year 1997[84] for nonroad spark ignition engines that have a gross power output at or below 19 kilowatts. These engines are used principally in lawn and

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[80] 63 Fed. Reg. 18978 (April 16, 1998).
[81] 73 Fed. Reg. 37096 (June 30, 2008).
[82] 67 Fed. Reg. 68242 (November 8, 2002).
[83] 60 Fed. Reg. 34582 (July 3, 1995).
[84] Ibid; Model year 1997 is defined as "The 1997 model year will run from January 2, 1996 to December 31, 1997."

garden equipment, including, but not limited to lawn mowers, leaf blowers, trimmers, chainsaws, and generators.

In October 1996, the USEPA promulgated regulations applicable to new gasoline spark ignition marine engines that established VOC and NO_x standards. These new standards were phased in between the years 1998 to 2006.[85]

In March 1999, the USEPA promulgated Phase 2 regulations to control emissions from new nonroad spark ignition engines.[86] These regulations established tighter VOC and NO_x standards for non-handheld equipment such as lawn mowers and commercial turf equipment. The new standards were phased in between the years 2001 and 2007.

In April 2000, the USEPA promulgated additional Phase 2 regulations to control emissions from new nonroad spark ignition engines.[87] This regulation established tighter VOC, NO_x, and CO standards for handheld equipment such as string trimmers (i.e., weedwhackers), leaf blowers and chainsaws. The new standards were phased in between the years 2002 to 2007 with an allowance for small volume engine manufacturers to meet these standards from 2008 to 2010.

On October 8, 2008, the USEPA promulgated new rules that would set stricter standards for most lawn and garden equipment and small recreational watercraft.[88] Specifically, the proposal would establish new exhaust emission standards that manufacturers are expected to meet using catalytic converters in many types of small watercraft, lawn, and garden equipment. The new standards would apply as early as 2010 to 2011 for watercraft and 2011 to 2012 for most lawn and garden equipment (under 25 horsepower). This proposed rule also includes fuel evaporative standards for all the types of equipment and watercraft covered in the rulemaking to be phased in between 2009 to 2016.

3.4 CAA Required Control Measures

3.4.1 Motor Vehicle Inspection and Maintenance Program Certification

Vehicle inspection and maintenance (I/M) is the periodic inspection of the emissions control systems of motor vehicles. I/M programs help improve air quality by identifying cars and trucks with high emissions that may need repairs. The 1990 Amendments to the Clean Air Act (CAA) mandated I/M programs for certain ozone and carbon monoxide nonattainment areas depending on various factors such as air quality status, population, and/or geographic location. Currently, I/M programs are used as an emissions control strategy primarily in ozone nonattainment and maintenance areas. States that are required to implement I/M programs under the CAA include these programs in their SIPs.

The CAA Amendments of 1990 established two performance levels of I/M programs: “Basic” and “Enhanced”.

- Basic I/M programs are required in ozone nonattainment areas classified as Moderate with an urbanized population over 200,000 in 1990 and require testing for light-duty cars only.
- Enhanced I/M programs are required in areas classified as Serious, Severe, and Extreme for ozone, and with urbanized populations over 200,000 in 1980. Also, all I/M

[85] 61 Fed. Reg. 52088 (October 4, 1996).
[86] 64 Fed. Reg. 15207-15208 (March 30, 1999).
[87] 65 Fed. Reg. 24268 (April 25, 2000).
[88] 73 Fed. Reg. 59034 (October 8, 2008).

programs in Metropolitan Statistical Areas (MSA) located in the Northeast Ozone Transport Region (OTR) with a 1980 population of over 100,000 must be Enhanced, regardless of its air quality classification. Both light-duty cars and trucks must be inspected in Enhanced I/M areas.

Inspection/maintenance (I/M) programs are required in both ozone and carbon monoxide (CO) nonattainment areas. States are responsible for developing their own I/M program to meet USEPA's I/M regulations (40 CFR part 51, subpart S). I/M regulations allow for some level of flexibility in how a state designs its I/M program, provided the program meets all requirements of the required I/M performance standard.

In 1974, New Jersey was among the first inspection and maintenance (I/M) programs in the nation to implement mandatory emissions testing for motor vehicles, primarily in response to the CAA of 1970. Early generations of this vehicle testing program were I/M programs that relied for the most part on exhaust emission testing using an idle test, which measured emissions in tailpipe exhaust while the vehicle was at idle. New Jersey's I/M program remained largely unchanged, with only minor updates in equipment and test standards, from 1974 until 1999. In accordance with the requirements of the CAA, New Jersey implemented a statewide Enhanced I/M program on December 13, 1999. In 2003, on-board diagnostics (OBD) testing was added for newer vehicles. The I/M program is jointly implemented by the Department and the Motor Vehicle Commission (MVC).

On April 3, 2009, and September 9, 2016, New Jersey adopted amendments to its enhanced I/M Program. These amendments were shown to be consistent with New Jersey's SIP and its efforts to meet and/or maintain the 8-hour ozone NAAQS. The April 3, 2009, amendments were approved by USEPA on March 15, 2012, [89] and the September 9, 2016, amendments were approved by USEPA on May 9, 2018.[90]

Vehicles inspections in New Jersey are conducted on light, medium and heavy duty gasoline vehicles and light and heavy duty diesel vehicles. Inspections that incorporate OBD include light and medium duty gasoline vehicles and light duty diesel vehicles. New Jersey also adopted rules on September 9, 2016, to require OBD for eligible heavy-duty gasoline and diesel vehicles and on April 21, 2023, for medium duty diesel vehicles. These new programs have not yet been implemented by the New Jersey Motor Vehicle Commission.

Performance Standard Modeling

New Jersey's Southern NJ-PA-DE-MD ozone nonattainment area was reclassified from Marginal to Moderate for the 2015 70 ppb ozone NAAQS on October 7, 2022. This action was finalized in USEPA's final rule Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of 5 Areas Classified as Marginal for the 2015 Ozone National Ambient Air Quality Standards.[91] As a result of this reclassification rule, New Jersey is required to conduct Performance Standard Modeling (PSM) as detailed in the final rule. Although this rule only applies to the Southern NJ-PA-DE-MD nonattainment area, at this time New Jersey has performed the performance standard modeling for the New Jersey portions of both the Southern NJ-PA-DE-MD and Northern NJ-NY-CT nonattainment areas because the New Jersey I/M program is statewide. In addition, although the rule requires that to meet the minimum I/M requirements for a newly classified Moderate nonattainment area the Basic performance standard test must be met, New Jersey will demonstrate the achievement of

[89] 77 Fed. Reg. 15263 (March 15, 2012)
[90] 83 Fed. Reg. 21174 (May 9, 2018)
[91] 87 Fed. Reg. 60897 (October 7, 2022)

the more stringent I/M performance standard test for Enhanced I/M programs. As stated above, New Jersey is continuing implementation of its Enhanced I/M program statewide.

The New Jersey I/M program for light-duty vehicles has not changed since 2016 when the most recent I/M SIP revision, including a statewide Enhanced PSM analysis, was submitted to USEPA on September 16, 2016. The USEPA approved this SIP revision on May 9, 2018,[92] effective on June 8, 2018. As discussed above, since that time, New Jersey has increased the overall stringency of its I/M program by the adoption of rules that expand its I/M program to include medium-duty diesel vehicles and heavy-duty vehicles. The modeling for this SIP does not include these emissions reductions as the programs have not yet been initiated. When these programs are initiated, the significant additional emission benefits expected from these rules cannot be reflected in the PSM analysis because the USEPA limits the PSM methodology to consideration of light-duty vehicles only.

Performance Standard Modeling Details:

As part of its final rule for inspection and maintenance requirements, the USEPA established "model" programs for areas that were required to implement I/M programs. The model programs establish I/M performance standards. An I/M performance standard is a collection of program design elements that define the USEPA benchmark program. A state's program is compared to that USEPA benchmark program in terms of its potential to reduce emissions of the ozone precursors, VOCs, and NO_x. I/M program design elements include test frequency (annual or biennial), waiver/compliance rate, vehicle types tested, model year (MY) vehicles included in testing, new vehicle grace periods, and test type (idle or onboard diagnostic-OBD). The I/M performance standards are defined in the I/M regulations at 40 CFR 51.352 for Basic I/M programs and 40 CFR 51.351 for Enhanced I/M programs.

The purpose of the performance standard is to provide a gauge by which the USEPA can evaluate the adequacy and effectiveness of each state's I/M program. USEPA provided templates that states can use to develop the Basic or Enhanced performance standard input table to be used in their PSM modeling.

To perform a PSM analysis, the following two scenarios must be modeled:

1. Existing state I/M program scenario – this scenario represents a state's program currently in operation and includes all of the local parameters and control measures as well as the inputs required to define the program; and,
2. USEPA's Performance standard benchmark scenario – this scenario represents the applicable USEPA defined benchmark program, which includes all of the local area parameters and the USEPA's I/M program with the elements of the applicable performance standard.

The results of these scenarios are compared to determine the differences between the existing program's emissions rates and the USEPA's performance standard benchmark scenario. For an Enhanced I/M program, if the differences between the state's existing program emissions levels and the USEPA's performance standard benchmark emission levels for VOC and NO_x are each less than or equal to 0.020 grams-per-mile (g/mile), then the state program is considered to have met the enhanced performance standard. If after conducting the PSM analysis, the area's I/M program does not meet the corresponding performance standard, then the state would need

[92] 83 Fed. Reg. 21174 (May 9, 2018)

to adjust its program and conduct a new PSM analysis based on new I/M program revisions to meet the appropriate I/M performance level. As stated above, although the moderate classifications for the 2015 NAAQS only requires a state's I/M program to be compared against the Basic performance standard, New Jersey used the more stringent Enhanced performance standard benchmark for the purposes of this demonstration. Meeting the Enhanced performance standard also demonstrates that the Basic performance standard is met as well.

Guidance documents from USEPA used to develop this performance standard modeling analysis for New Jersey's nonattainment areas include:

1. Policy Guidance on the Use of MOVES3 for State Implementation Plan Development, Transportation Conformity, General Conformity, and Other Purposes, US EPA Office of Transportation and Air Quality, EPA-420-B-20-044, November 2020.
2. MOVES3 Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity, US EPA Office of Transportation and Air Quality, EPA-420-B-20-052, November 2020.
3. Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model, US EPA Office of Transportation and Air Quality, EPA-420-B-22-034, October 2022.

Modeling Parameters and Assumptions:

New Jersey's Enhanced I/M program is a hybrid network system that consists of both centralized and decentralized facilities. A private contractor to the state operates the centralized portion of the inspection network, consisting of a network of centralized inspection facilities. The decentralized portion of the inspection network is comprised of over 1,000 privately owned and operated private inspection facilities that are licensed by the New Jersey Motor Vehicle Commission (NJMVC) to perform vehicle inspections on behalf of the state. This hybrid network design gives motorists a choice as to where to have their vehicles inspected.

New Jersey's I/M program covers all 1996 MY and later gasoline-fueled vehicles and trucks except non-OBD equipped vehicles greater than 8,500 lbs gross vehicle weight rating (GVWR). The test frequency of New Jersey's enhanced I/M program is biennial, meaning vehicle inspections are required every two years. There is an exception to this that applies to certain classes of commercial vehicles, limousines, taxis and jitneys that receive annual inspections. The exemption (grace) period for new vehicles is five years, however commercial vehicles do not have a new vehicle exemption period. New Jersey's light duty I/M program consists of OBD inspections only. I/M program parameters are shown in the following tables.

NJ Enhanced I/M Program Design

Program Element	**New Jersey's Enhanced I/M Program**
Compliance Rate	96%
Waiver Rate	0%
Failure Rate	0%
Regulatory Class Coverage for MOVES Source-types: 21, 31 and 32	21: 100% 31: 98.9% 32: 92.9%
Overall I/M Program Effectiveness for MOVES Source-types: 21, 31 and 32	21: 96.00% 31: 94.90% 32: 89.10%
Program Start Date	1974

Program Element	New Jersey's Enhanced I/M Program
Test Frequency	Biennial except annual for commercial vehicles
New Vehicle Exemption	5 Years
Model Year (MY) Coverage	1996 and later MYs
Vehicle Type Coverage	All gasoline-fueled vehicles and trucks except non-OBD equipped vehicles greater than 8,500 lbs. GVWR
Exhaust and Evaporative Emission Test	OBD - 1996 and later MYs

I/M Program ID's Used in the New Jersey MOVES Runs

IMProgramID	InspectFreq	testStandardsID	begModelYearID	endModelYearID
9	2	51 (exh OBD)	1996	Present
16	1	51	1996	Present
23	2	43 (ev OBD)	1996	Present
26	1	43	1996	Present

Exhaust I/M Programs

MOVES Source-types	Description	MY Range	Test Type	Freq	New Vehicle Exemption?
21. Passenger Car		1981 - 1995 1996 - Pres	None exhOBD	NA 2	NA Yes
31. Passenger Truck	Minivans, pickups, SUVs and other 2-axle / 4-tire trucks used primarily for personal transportation	1981 - 1995 1996 - Pres	None exhOBD	NA 2	NA Yes
32. Light Commercial Truck	Minivans, pickups, SUVs and other trucks 2-axle / 4-tire trucks used primarily for commercial applications. Expected to differ from passenger trucks in terms of annual mileage, operation by time of day	1981 - 1995 1996 - Pres	None exhOBD	NA 1	NA No

Evaporative I/M Programs

MOVES Source-types	Description	MY Range	Test Type	Freq	New Vehicle Exemption?
21. Passenger Car		1970 - 1995 1996 - Pres	None evOBD	NA 2	NA Yes
31. Passenger Truck	Minivans, pickups, SUVs and other 2-axle / 4-tire trucks used primarily for personal transportation	1970 - 1995 1996 - Pres	None evOBD	NA 2	NA Yes
32. Light Commercial Truck	Minivans, pickups, SUVs and other trucks 2-axle / 4-tire trucks used primarily for commercial applications. Expected to differ from passenger trucks in terms of annual mileage, operation by time of day	1970 - 1995 1996 - Pres	None evOBD	NA 1	NA No

USEPA's October 2022 guidance allows states to use representative counties provided regional characteristics and the I/M program are similar among counties within a nonattainment area. New Jersey's I/M program is uniform statewide. Middlesex and Mercer counties were chosen to

represent the Northern and Southern nonattainment areas as these counties contain a representative mix of the various roadway types that comprise each nonattainment area. To conduct a PSM analysis with MOVES using a representative county, the areawide vehicle population and VMT can be applied to the single county for the model run. Both the vehicle population and VMT inputs were summed for the respective areas and used for the representative county runs. The analysis year of 2023 was selected for this PSM since it is the year that will be used in determining attainment for the 2015 ozone NAAQS. Modeling for this analysis was performed using the MOVES3.1 emissions model and reflected the latest planning assumptions that are covered in greater detail in Appendix 4-6.

MOVES runs were conducted using inventory mode for Mercer and Middlesex counties. Two scenarios were run for each representative county. One run using New Jersey's existing I/M program and one run using the Enhanced I/M program performance standard program generated using USEPA's Enhanced program template. To perform the evaluation, users must convert MOVES output emissions from mass-per-time into mass-per-distance units. Once the runs were completed, the EmissionsRates.sql script provided in MOVES was used to generate grams per mile rates based on the results of the run.

Results:

The following table shows the emissions obtained from modeling the USEPA Enhanced I/M performance standard and New Jersey's existing I/M program. Modelling files including MOVES input files, run specifications, input databases, output databases, and emission results files/summaries for this performance standard modeling analysis are provided in Appendix 4-6.

Performance Standard Modeling Results

Nonattainment Area and Representative County	**Scenario**	**NO_x (g/mile)**	**VOC (g/mile)**	**Meets PSM Criteria? (Differences < or = to 0.020 g/mile)**
Southern NJ/PA/DE/MD (Mercer County)	NJ Program	0.277	0.130	NA
	Enhanced Performance Standard (PS) Benchmark	0.278	0.128	NA
	Difference (NJ Program - PS Benchmark)	-0.002	0.002	Yes
Northern NJ/NY/CT (Middlesex County)	NJ Program	0.363	0.118	NA
	Enhanced Performance Standard (PS) Benchmark	0.364	0.116	NA
	Difference (NJ Program - PS Benchmark)	-0.001	0.002	Yes

As shown in above, for all pollutants the emissions differences between New Jersey's existing I/M program and the performance standard I/M program are not greater than 0.02 g/mile. Therefore, New Jersey's existing I/M program passes the performance standard test for both the northern and southern nonattainment areas. New Jersey certifies that, based on the results of the PSM analysis, the existing SIP-approved New Jersey I/M program without modification meets the performance standard for purposes of the 2015 ozone NAAQS.

IM Program Conclusions

New Jersey has implemented and maintained a statewide Enhanced I/M program for decades that meets the criteria established by USEPA regulations for an Enhanced program. The implementation of this program continues to be an integral part of New Jersey's plan to attain and maintain compliance with the health-based National Ambient Air Quality Standards (NAAQS) for ozone. New Jersey certifies that its rules at N.J.A.C. 7:27-14 and 15, N.J.A.C. 7:27B-4 and B-5 and the Motor Vehicle Commission (MVC) rules at N.J.A.C. 13:20-43, satisfy federal requirements for an enhanced motor vehicle I/M Program for the 2015 70 ppb 8-hour ozone NAAQS for the New Jersey portions of the Northern NJ-NY-CT Nonattainment Area, Southern NJ-PA-DE-MD Nonattainment Area and statewide in New Jersey.

3.4.2 Phase II Vapor Recovery Program Certification

New Jersey adopted its first statewide Phase II (also referred to as Stage II) vapor recovery rules in 1988 based on the California program. California started developing vapor recovery control rules and programs in 1975. The 1990 CAA, sections 182(b)(3), (c), (d), and (e) or 42 U.S.C. 7511a(b)(3), 7511a(c), 7511a(d) and 7511a(e), required Phase II gasoline vapor recovery systems as an emissions control measure in areas that were classified as "moderate", "serious," "severe," and "extreme" nonattainment with the ozone NAAQS (serious and above after 1994.) USEPA approved New Jersey's Phase II rules at N.J.A.C. 7-27-16.3 on March 26, 1991.[93] New Jersey adopted amendments to its Phase II rules which were effective June 2, 2003. USEPA approved those amendments on August 2, 2004.[94]

Vapor recovery systems are installed at gasoline dispensing facilities to control hydrocarbon emissions from gasoline vapors during the delivery and dispensing of gasoline. These systems are comprised of two Phases, Phase I and Phase II (also referred to as Stage I and Stage II). Phase I systems control the emissions of gasoline vapors during the transfer of gasoline from the tanker truck to the gasoline dispensing facility storage tank by returning the vapors back to the truck. Phase II systems are designed to capture gasoline vapors displaced from the vehicle fuel tank during refueling and transport those vapors through the nozzle and vapor return lines back to the storage tank.

The CAA required two types of controls for capturing gasoline vapor during vehicle refueling: Phase II vapor recovery systems, and onboard refueling vapor recovery (ORVR) systems. The purpose of ORVR is to collect gasoline refueling emissions from within the vehicle fuel tank. During refueling, a carbon canister in the vehicle captures the fuel tank vapors and later releases them to the engine for combustion. CAA Section 202(a)(6), 42 U.S.C. 7521(a)(6) requires USEPA to develop standards for ORVR controls on light-duty vehicles and provides for the Phase-in of the ORVR requirement. On April 16, 1994, USEPA promulgated regulations setting standards for and requiring the Phase-in of ORVR controls on new vehicles. Installation of ORVR systems was Phased in over the 1998 to 2006 vehicle model years.

Congress recognized that ORVR and Phase II would eventually become largely redundant technologies and provided authority to the USEPA to allow states to remove Phase II from their SIPs after the USEPA finds that ORVR is in widespread use. Effective May 16, 2012, the USEPA waived the CAA Phase II requirements after determining that ORVR is in widespread use. However, the widespread use date is not equivalent to a date where there is zero emission impact in every state. In order to remove existing Phase II requirements, states are required to do a state specific demonstration and have a USEPA-approved SIP revision in accordance with the demonstration requirements outlined in the widespread use rule (77 FR 28772, May 16,

[93] 56 Fed. Reg. 124500 (March 26, 1991)
[94] 69 Fed. Reg. 40321 (August 2, 2004)

2012) and USEPA's 2012 Guidance (Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures, EPA-457/B12-001, August 07, 2012).

The NJDEP proposed revisions to New Jersey's Phase II rules and SIP on July 3, 2017. This proposal can be found at: http://www.state.nj.us/dep/baqp/sip/siprevs.htm. The final rules are effective November 20, 2017 (49 N.J.R. 3590). A copy of the rule adoption can be found at: http://www.state.nj.us/dep/aqm/adopt.html. USEPA approved NJDEP's SIP Revision on June 18, 2020.

New Jersey certifies that its Phase II vapor recovery rules at N.J.A.C. 7-27-16.3, and associated amendments and SIP revision, are in accordance with Federal requirements for the 2015 70 ppb 8-hour ozone NAAQS.

3.4.3 Clean Fuel for Fleets Certification

The 1990 Clean Air Act (CAA) amendments included numerical standards for the Clean Fuel Fleet program that were intended to encourage innovation and reduce emissions for fleets of motor vehicles in Serious nonattainment areas (with populations > 250,000 in the 1980s) as compared to conventionally fueled vehicles available at the time. See CAA Sections 243 and 245. With the implementation of federal Tier 3 light-duty standards (40 CFR Part 86, Subpart S) and the continued implementation of current heavy-duty vehicle standards (40 CFR Part 1036), the Clean Fuel Fleets standards became either less stringent than or equivalent to the standards that apply to vehicles and engines today.

The United States Environmental Protection Agency (USEPA) revised 40 CFR Part 88 – Clean Fuel Vehicles to provide a compliance option for areas applicable to the CFF requirement. Essentially the compliance option allows states to certify that they meet the CFF requirement by describing in a SIP that vehicle and engines sold are certified to current emission standards under 40 CFR Part 86, Subpart S. New Jersey confirmed this in the November 2021 SIP by identifying this federal requirement as a control measure within the SIP.

In addition to the federal rule, new light-duty vehicles sold in New Jersey are certified to the California Low Emission Vehicle (LEVIII) standards in accordance with N.J.A.C. 7:27-29, which was effective in 2009. This control measure was also included in the November 2021 SIP. Also, new heavy-duty vehicles sold in New Jersey will be required to meet the standards of the California Advanced Clean Truck regulations adopted on November 21, 2021, at N.J.A.C. 7:27-31 and 33 and beginning with model year 2025, and the Omnibus regulations adopted on April 21, 2023, at N.J.A.C. 7:27-28 and beginning with model year 2027. California vehicle standards adopted by New Jersey, as authorized by Section 177 of the Clean Air Act, must be either equal to, or more stringent than, the corresponding federal certification standards under 40 CFR Part 86, Subpart S or Part 1036.

Therefore, New Jersey certifies that it has satisfied the requirements (as specified in 40 CFR Part 88) for a Clean Fuel Fleets program because new vehicles sold in the state meet or are more stringent than the federal certification standards under 40 CFR Part 86, Subpart S or Part 1036.

3.5 Additional New Control Measures to Address Ozone Nonattainment

RACM

New Jersey is in the process of proposing the following rules to address emissions of NO_x and VOCs.

- Architectural and Industrial Maintenance Coatings: The proposed rules will control VOC emissions from architectural and industrial maintenance coatings by incorporating amendments that are based on the OTC 2011 model rule and the California Air Resource Board (CARB) 2007 suggested control measure. The proposed rules will lower the VOC content for several coating categories. It is anticipated that the VOC reductions from this rule will be about six tons per day.

- Consumer Products: The proposed rules will control VOC emissions from consumer products by incorporating amendments that are based upon the OTC 2010 and 2012 model rules, which are based on California rules. The proposed rules will incorporate VOC limits for several new categories of products and will lower the VOC limits for several existing categories of products. It is anticipated that the VOC reductions from this rule will be about five tons per day.

Other New Jersey Initiatives and Adopted Rules

In addition, New Jersey is evaluating, implementing, proposing and adopting several additional measures as part of its climate change goals, which will also reduce ozone precursor emissions. These measures include the following:

Clean Energy

New Jersey is a national leader in reducing emissions from the electric power sector. In addition to its adopted air pollution rules, New Jersey has recently implemented several actions that will increase renewable energy, thereby resulting in further reductions in ozone and PM precursor emissions from the New Jersey electric power sector. These measures include:

- Offshore Wind Goals: Governor Murphy signed three Executive Orders[95,96,97] that direct all New Jersey state agencies with responsibilities under the Offshore Wind Economic Development Act to fully implement it. The Orders also established goals to increase New Jersey's offshore wind power to 11,000 megawatts by 2040.

- Regional Greenhouse Gas Initiative (RGGI): RGGI is the first mandatory market-based program in the United States to reduce greenhouse gas emissions from the power sector. New Jersey's participation in RGGI is part of Governor Murphy's goal to achieve 100% clean energy by 2050. On June 17, 2019, New Jersey formally rejoined RGGI when the Department adopted two rules.[98] While GHG reductions are outside the scope of this SIP, it has been shown that GHG reductions will have a co-benefit of NO_x/VOC reductions.

- Clean Energy Act: On May 23, 2018, Governor Murphy signed the New Jersey Clean Energy Act (P.L.2018, c.17). The Act strengthened New Jersey's Renewable Portfolio Standard by requiring 35% renewable power by 2025 and 50% renewable power by 2030. It also requires energy efficiency measures to reduce annual electricity usage by 2% and annual natural gas usage by 0.75% and codifies goals for offshore wind and energy storage.

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[95] Executive Order #8, January 31, 2018. https://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf
[96] Executive Order #92, November 21, 2019. https://nj.gov/infobank/eo/056murphy/pdf/EO-92.pdf
[97] Executive Order #307, September 21, 2022. https://nj.gov/infobank/eo/056murphy/pdf/EO-307.pdf
[98] The Carbon Dioxide Budget Trading Rule and the Global Warming Solutions Fund rule, June 17, 2019.

Electric Vehicles

To reach its air pollution goals, the State must transition from fossil fuel-powered vehicles to electric vehicles. New Jersey will continue to develop sufficient electric vehicle (EV) infrastructure, conduct education outreach, and provide incentives through funding and grant programs. On January 17, 2020, Governor Murphy signed landmark legislation that established goals and incentives for the increased use of plug-in electric vehicles in New Jersey. This legislation establishes New Jersey as a leader in attracting electric vehicles to the state thereby making significant contributions to the attainment of existing air pollution and energy goals. The Law includes the following goals/requirements:

- At least 330,000 of the total number of registered light duty vehicles in the State shall be electric vehicles by December 31, 2025, and at least 2 million by end of 2035.
- At least 85 percent of all new light duty vehicles sold or leased in the State shall be plug-in electric vehicles by December 31, 2040.
- By December 31, 2025, at least 400 DC Fast Chargers and 1,000 Level Two Chargers shall be available for public use in the State,
- By December 31, 2025, at least 15 percent of all multi-family residential properties in the State shall be equipped with Electric Vehicle Service Equipment (EVSE) for the routine charging of plug-in electric vehicles by residents, and this rises to 30 percent by December 31, 2030.
- By December 31, 2024, at least 10 percent of the new bus purchases made by the New Jersey Transit Corporation shall be zero emission buses, and the percentage of zero emission bus purchases shall increase to 50 percent by December 31, 2026, and 100 percent by December 31, 2032, and thereafter.

The State has awarded $157million since 2019 to support the adoption of, access to, and charging of light-duty zero-emission vehicles (ZEVs), resulting in 25,380 vehicles incentivized for private/personal use and 246 vehicles incentivized for local government. This funding also incentivized 1,530 locations with 5,782 charging stations and 9,537 ports. Since 2019, the State has also awarded $203 million in funding to support the purchase of, access to, and charging of medium- and heavy-duty electric vehicles. This funding supported the purchase of 286 trucks/cargo vans, including 95 garbage trucks, 242 buses/shuttle buses, including 32 school buses, and 162 port and airport vehicles/equipment.

In 2011, only 338 electric vehicles were registered in the State. As of June 2023, 123,551 electric vehicles, including battery electric vehicles and plug-in hybrid electric vehicles, are registered in the State, marking a significant increase over the ten-year period. See https://dep.nj.gov/drivegreen/electric-vehicle-basics/ website for more information.

To meet the State's goals to transition the transportation sector, the Department will also:

- Work with Treasury to develop both a standing State contract to enable the installation of electric vehicle chargers at State properties and a state fleet transition plan to ensure the maximum number of state vehicle purchases are electric, taking advantage of the State's purchasing power to influence electric vehicle adoption and markets.

- In accordance with the Electric Vehicle Law, N.J.S.A. 48:25-1, develop goals for vehicle electrification and infrastructure development that address medium-duty and heavy-duty on-road diesel vehicles.

- Continue collaboration with the Northeast States for Coordinated Air Use Management (NESCAUM), a non-profit association of 8 northeastern states, to implement a multi-state zero-emission medium- and heavy-duty vehicle action plan.

- Continue outreach campaigns to enhance public awareness and education that include the following:
    - Publicize available transportation electrification resources through its “Drive Green” website;
    - Pursue partnerships with car dealerships and the PlugStar dealer training, which since launch, has resulted in 39 dealers trained and 21,400 visits to the website;
    - Participate in the regional “Drive Change. Drive Electric” consumer awareness campaign, which has seen 23,646 visitors to the State’s website, 13,231 clicks on paid social media, and 20,343 clicks on paid search on the State’s website;
    - Destination Electric campaign, which has recently added three New Jersey communities;
    - Development of a State-specific consumer awareness campaign as required by the EV Law;
    - Promote EV “Ride and Drive” events. There have been 16 held so far, with estimated attendees and 1,039 test drives.

- Continue to implement NJDEP Administrative Order 2021-05, establishing the Department’s policy to only purchase the most fuel-efficient vehicles possible, including purchasing combustion engine vehicles only where strictly necessary, and requiring the deployment of necessary EV charging infrastructure as well as the development of plans to deploy charging infrastructure on State-owned lands and at workplace facilities.

- Continue developing strategies and financial incentives to ensure all communities have access to clean transportation through electric ride sharing and ride hailing.

- In coordination with agency partners (BPU/EDA/DOT), continue focused investment of available resources (e.g., National Electric Vehicle Infrastructure Formula Program, Infrastructure Investment and Jobs Act) to build charging infrastructure and incentivize electric vehicle adoption and transition. NJ Department of Transportation will administer approximately $100 million as part of NJ’s National Electric Vehicle Infrastructure (NEVI) Formula Program which will focus on construction or upgrades to direct current fast chargers along NJ interstates. As part of a $700 million national competition, DEP was awarded $10 million in funding from the Charging and Fueling Infrastructure Discretionary Grant Opportunity’s Community Program (CFI) for the Urban/Suburban Area Charging and Fueling Solutions focus area. DEP will use the funding to provide convenient, affordable EV charging solutions for residents of multi-unit dwellings, prioritizing LMI communities. NJ also received $6 million in Electric Vehicle Charger Reliability and Accessibility Accelerator funding to upgrade and repair existing electric vehicle charging infrastructure.

- DEP will focus $728,000 in Clean Air Act Grants from the Inflation Reduction Act to provide an awareness campaign and technical assistance on transitioning to electric vehicles.

- Work with the Division of Community Affairs and legislative partners to update building codes to ensure adoption of the most progressive standards including those requiring new buildings to be “EV ready” which will lower barriers and costs of adoption for new EV users.

The Electric School Bus Program

The NJDEP’s Electric School Bus Grant program provides up to $15,000,000 per year for three years to replace diesel school buses with battery-electric school buses per P.L. 2022, c.86, The New Jersey Electric School Bus Law. The program is designed to encourage and monitor the transition to electric school buses throughout the state and in each year of funding, requires at least half of the school districts or school bus contractors selected must operate within an overburdened community. The first year of funding will provide grants for two different programs. The first program is for diesel to electric school bus replacements and the second program is a bi-directional charging pilot program. The bi-directional charging pilot program will provide additional funds for equipment which will allow the electric school bus to send electricity back to a building to offset peak electric demands. Eligible applicants are schools and school districts that operate school bus services as well as school bus contractors working in conjunction with schools or school districts.

The rules the NJDEP has adopted in support of its electric vehicle goals are discussed below.

New Jersey Protecting Against Climate Threats (NJPACT) Rules

In addition to the legislation discussed above, on January 27, 2020, Governor Murphy signed Executive Order Number 100 (EO 100) that initiated a targeted regulatory reform effort that will modernize New Jersey environmental laws. EO 100 is referred to as Protecting Against Climate Threats (NJ PACT). NJ PACT will usher in systemic change, modernizing air quality and environmental land use regulations, that will enable governments, businesses, and residents to effectively respond to current climate threats and reduce future climate damages.

As a national leader in environmental protection, the NJDEP has and will continue to create a regulatory roadmap to reduce emissions, build resilience, and adapt to a changing climate. This includes the enactment of new air pollution regulations that achieve critically needed reductions in carbon dioxide and short-lived climate pollutants (e.g., methane and black carbon) including technology-forcing measures that pave the way for a clean-energy economy.

Based on this EO, New Jersey has adopted several rules as follows:

Advanced Clean Trucks (ACT)

On November 1, 2021, NJDEP adopted rules based on California’s Advanced Clean Trucks regulations requiring increasing sales fractions of medium and heavy-duty trucks be zero emission vehicles (ZEVs). The requirements of this rule are identical to the California Advanced Clean Trucks rule and will be effective starting with model year 2025.

EGU Emission Limits

On December 2, 2022, NJDEP adopted rules which set new Electric Generating Unit (EGU) emission limits starting June 1, 2024. These rules are being submitted for inclusion into New Jersey’s SIP as discussed in Section 3.2.

#4 and #6 Fuel Oil Ban

On December 2, 2022, NJDEP adopted rules banning #4 and #6 fuel oil, with a compliance date in 2025 with a two year sell through period. These rules are being submitted for inclusion into New Jersey's SIP as discussed in Section 3.2.

Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards

On December 29, 2022, NJDEP adopted rules that require diesel mobile cargo handling equipment at ports and intermodal rail yards to meet performance standards that reflect best available control technology, with a compliance date in 2025.

Heavy Duty New Engine Standards (Omnibus)

On April 21, 2023, NJDEP adopted rules based on California's Omnibus regulations that require manufacturers selling new gasoline and diesel-powered vehicles rated in excess of 8,500 pounds gross vehicle weight rating (GVWR) in New Jersey to comply with the California emission standards for NO_x. The requirements begin with model year 2027.

Medium Duty Diesel Vehicles (MDDVs) IM

On April 21, 2023, NJDEP adopted amendments that include a medium duty diesel inspection and maintenance program. The program establishes emission inspection procedures and standards for diesel vehicles with a GVWR greater than 8,500 and less than 14,001 pounds. The estimated start date of the program is in 2026.

Advanced Clean Cars II

On November 21, 2023, NJDEP adopted rules based on California's Advanced Clean Cars II regulations requiring manufacturers of passenger cars and light-duty trucks to meet an annual zero-emission vehicle (ZEV) requirement. Additionally, the regulation includes more stringent multi-pollutant exhaust emission standards that manufacturers of internal combustion engine passenger cars, light-duty trucks, and medium-duty vehicles must meet. The requirements begin with model year 2027.

Other Transportation and Clean Air Initiatives

On April 17, 2020, the NJDEP, Board of Public Utilities (BPU) and Economic Development Authority (EDA) jointly released a strategic funding plan for investing the auction proceeds from the State's participation in RGGI. New Jersey plans to invest an estimated $80 million each year in programs that reduce both greenhouse gas emissions and criteria pollutants. The majority (75%) of this investment will be used for clean and equitable transportation projects to accelerate transportation electrification in the State, focusing on reducing emissions from transportation sources in communities disproportionately impacted by the effects of pollution.[99] The results of the spending are provided on the New Jersey RGGI Climate Investment Dashboard.[100]

In addition, New Jersey is taking action in two areas that are important for future reductions in both GHGs and PM2.5 precursor pollutants; the implementation of fuel cell technology and the promotion of ZEVs for medium/heavy duty vehicles.

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[99] https://nj.gov/rggi/docs/rggi-strategic-funding-plan.pdf
[100] https://njdep.maps.arcgis.com/home/item.html?id=71e62ee3de2d4a6585bf4766881406c6

On June 19, 2020, Governor Murphy signed legislation that establishes a New Jersey Fuel Cell Task Force that will recommend a plan to increase the use of fuel cells in the State. The task force will issue a yearly report that will include any recommendations for legislative or regulatory action that are necessary to effectuate the plan.[101]

On July 14, 2020, it was announced that New Jersey was one of 15 states and the District of Columbia to sign a memorandum of understanding (MOU).[102] The MOU commits the signers to work collaboratively to advance and accelerate the market for electric medium- and heavy-duty vehicles. The goal is to ensure that 100 percent of all new medium- and heavy-duty vehicle sales be zero emission vehicles by 2050 with an interim target of 30 percent zero emission vehicle sales by 2030. A multi-state action plan was released July 2022 to identify barriers and propose solutions to support widespread electrification of medium- and heavy-duty vehicles.[103]

New Jersey Coal Electric Generating Plants

New Jersey has been a leader in reducing air pollution from Electric Generating Units (EGUs). Due to several New Jersey control measures that addressed pollution from EGUs in New Jersey, the final three coal EGUs in New Jersey ceased operation in 2022. According to the USEPA's Clean Air Markets Program Data (CAMPD) Carneys Point Unit 2 and Logan Generating Plant Unit 1 last operated on May 31, 2022, and Carneys Point Unit 1 last operated on June 7, 2022. The Carneys Point operating permit for the coal-fired Units 1 and 2 was terminated on September 15, 2022, and the units were confirmed to be in a nonoperational state by NJDEP Enforcement staff. The operating permit for Logan Generating Plant Unit 1 was terminated on December 2, 2022, and the unit was confirmed to be in a nonoperational state by NJDEP Enforcement staff.

Regional Haze "Asks"

The Federal Clean Air Act sets a national goal to restore visibility to its natural conditions in many of the national parks and wilderness areas in the United States of America. New Jersey is home to one of these areas, the Brigantine Wilderness Area in the Edwin B. Forsythe National Wildlife Refuge. Additional measures to control air pollution, including ozone precursors, in New Jersey and other states within its shared ozone nonattainment area, as well as upwind contributing states, have occurred as part of states' Regional Haze State Implementation Plans (SIPs) for the first implementation planning period of 2008-2018. States in the Mid-Atlantic Northeast Visibility Union (MANEVU) region are currently in various stages of developing Regional Haze SIPs for the second implementation planning period of 2018 -2028. New Jersey submitted its final Regional Haze SIP to USEPA on March 26, 2020. Included in the Regional Haze SIP was a list of "asks" for states that contribute to visibility impairment to consider undertaking as air pollution control measures in their Regional Haze SIPs. The "asks" addressed emissions of SO_2 and NO_x from states within and outside of the MANEVU Region.

The "asks" include more stringent controls for electric generating units (EGUs) including peaking combustion turbines, evaluation of emission sources to determine reasonable installation or upgrade of emission controls, adoption of MANEVU's 2007 ultra-low sulfur fuel oil standard, locking in lower emission rates by updating permits, enforceable agreements, and/or rules, and increased use of energy efficiency measures and other clean technologies including fuel cells, wind, and solar.

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[101] Senate No. 762, State of New Jersey, 219th Legislature.
[102] https://ww2.arb.ca.gov/sites/default/files/2020-07/Multistate-Truck-ZEV-Governors-MOU-20200714.pdf
[103] https://www.dec.ny.gov/docs/air_pdf/mhdzevmou041122.pdf

The “asks” also include a request for the Federal Land Managers consult with MANEVU Class I area states when scheduling prescribed burns, and USEPA to develop measures that will further reduce emissions from heavy-duty onroad vehicles and ensure that Class I Area state “Asks” are addressed by states identified as significantly contributing to MANEVU Class I areas.

Chapter 4 EMISSION INVENTORIES FOR 2015 OZONE NAAQS

4.1 Regional Modeling Air Emission Inventory

The regional air emission inventories used in the photochemical modeling for this SIP are based on the USEPA, State and Local, 2016-based modeling platform inventory collaborative. The modeling in this SIP utilizes a 2016 base year, specifically 2016 version 2 (2016v2) and version 3 (2016v3) hybrid, with a projection to 2023. The modeling includes the 2016v2 modeling platform updated with the early release of 2016v3 emissions for commercial marine vessels (CMV) and solvents. In addition, Ozone Transport Commission (OTC)-specific inventories for electric generating units (EGUs), which use the Eastern Regional Technical Advisory Committee (ERTAC) tool, and associated changes to non-EGU point sources were used instead of point source emissions from the USEPA modeling platform, which uses the Integrated Planning Model (IPM) for EGUs.

The modeling inventories include:

1. Annual county-level emissions for criteria air pollutants and their precursors, nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), fine particulates (PM2.5), course particulates (PM10), sulfur dioxide (SO_2) and ammonia (NH_3), by emission sector for each State in the modeling domain; Emissions for Canada are by province or sub-province and emissions for Mexico are by municipio. The OTC modeling domain used for this SIP is shown in Figure 6-1 in Chapter 6 and is titled 12OTC2;

2. Hourly emissions for the electric generating unit sector consistent with the USEPA's Clean Air Markets Division (CAMD) data for the 2016 base year and projected to 2023 using the Eastern Regional Technical Advisory Committee (ERTAC) Electric Generating Unit (EGU) Projection Tool;

3. Hourly emissions for the onroad sector consistent with USEPA MOVES3.1 and USEPA's 2016v2 modeling platform;

4. Temporal allocation profiles, which are used to convert annual emissions to monthly, daily or hourly; The temporal profiles and cross-reference files are consistent with the USEPA's 2016v2 modeling platform, with the exception of the ERTAC EGU and Non-EGU point sectors;

5. Hourly temporal profiles for the electric generating unit sector consistent with CAMD data;

6. Speciation profiles, which are used to disaggregate the total VOC and PM2.5 emissions to the chemical species expected by the air quality model; The speciation and cross-reference files were taken from USEPA's 2016v2 modeling platform and are based on the Speciate 4.5 database;

7. Spatial allocation profiles, which assign fractions of county-total emissions to the model grid cells intersecting the county based on a "surrogate" data type (e.g., population, housing data); The spatial surrogates for the 12 km domain were extracted from the National Grid 12 km U.S. gridding surrogates provided with USEPAs 2016v2 modeling platform;

8. Biogenic emissions calculated using the BEIS v3.7 in conjunction with a modified v5 of the Biogenic Emissions Landuse Database (BELD5).

A brief summary of the modeling emission inventories is discussed below, and additional details can be found in the following documents:

OTC Modeling Technical Support Documents (TSDs), 2016 based inventory platform, included in Appendix 4-1A and Appendix 4-1B:

Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union, 2016 Based Modeling Platform Support Document, Ozone Transport Commission, 1st Version, January 31, 2023;

Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union, 2016 Based Modeling Platform Technical Support Document: OTC V2/V3 Modeling Platform Update, Ozone Transport Commission, July 14, 2023;

USEPA Inventory Technical Support Documents (TSDs), 2016 based modeling platforms, which can be found on USEPA's website at https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms:

USEPA Technical Support Document (TSD), Preparation of Emissions Inventories for the 2016v1 North American Emissions Modeling Platform, March 2021;

USEPA Technical Support Document (TSD): Preparation of Emissions Inventories for the 2016v2 North American Emissions Modeling Platform, EPA-454/B-22-001, February 2022;

USEPA Technical Support Document (TSD): Preparation of Emissions Inventories for the 2016v3 North American Emissions Modeling Platform, EPA-454/B-23-002, January 2023.

ERTAC Documentation, included in Appendix 4-2:

2016v1 Emissions Modeling Platform Collaborative: Large Electric Generating Units (ERTAC EGU), SPECIFICATION SHEET: ELECTRIC GENERATION UNITS PREPARED USING THE ERTAC EGU EMISSION ESTIMATION TOOL.

4.1.1 2016 Base Air Emission Modeling Inventory

The 2016 base emission inventory year for the attainment demonstration was chosen based on monitoring and meteorological data. More details can be found in the Base Year Selection Workgroup Final Report in Appendix 4-3.

4.1.2 2023 Projection Air Emission Modeling Inventory

The future projection year emission inventory for the attainment demonstration modeling was chosen based on the required attainment date for the 2015 70 ppb 8-hour ozone NAAQS. Based on the moderate classification for both of New Jersey's nonattainment areas, the Northern NJ-NY-CT Nonattainment Area and the Southern NJ-PA-DE-MD Nonattainment Area have an attainment date of no later than August 3, 2024.

Because August 3rd is in the middle of the 2024 ozone season, attainment must be demonstrated for the last full ozone season. Compliance with the ozone NAAQS will be

determined based on three years of data: 2021, 2022, and 2023. Therefore, the future projection year emission inventory established for the attainment demonstration was 2023.

4.1.3 Biogenics

Biogenic emission sources are emissions that come from natural sources. Biogenic emissions must be accounted for in photochemical grid modeling, as most types are widespread and ubiquitous contributors to background air chemistry. Biogenic emissions from vegetation and soils are computed using a model that utilizes spatial information on vegetation, land use and environmental conditions of temperature and solar radiation. The model inputs are typically horizontally allocated (gridded) data, and the outputs are gridded biogenic emissions that can be speciated and utilized as input to photochemical grid models. Biogenic emissions for VOCs, NO_x and CO were calculated for input into the modeling. The emissions are based on the USEPA BEIS version 3.7 model. Biogenic emissions were processed in conjunction with a modified v5 of the Biogenic Emissions Landuse Database (BELD5).

4.1.4 Modeling Inventory SMOKE Processing

The USEPA Sparse Matrix Operator Kernel Emissions/Inventory Data Analyzer (SMOKE) model Version 4.8.1 was used to process the air emissions inventories to prepare them for input into the photochemical model. The purpose of SMOKE (or any emissions processor) is to convert the resolution of the emission inventory data to the resolution needed by an air quality model. Emission inventories are typically available with an annual-total emissions value for each emissions source. The models typically require emissions data on an hourly basis, for each model grid cell, and for each model species. Consequently, emissions processing involves transforming an emission inventory through temporal allocation, chemical speciation, and spatial allocation, to achieve the input requirements of the model. Additionally, a cross-reference file is needed to assign profiles to the inventory records by SCC, facility, geographic area such as state or county, or some other inventory characteristics. The USEPA provides a starting point for the profiles and cross-reference files as part of their latest modeling platforms.

4.1.5 Modeling Inventory Data

The 2016v2/v3 modeling filenames and emission summaries by state, sector, and pollutant for the OTC states are included in the July 14, 2023, OTC TSD. Emission summaries for New Jersey by SCC code, sector and pollutant are included in Appendix 4-4.

4.2 Point Source Emissions Statement Program Certification

Clean Air Act Section 183(a)(3)(B) requires that states have an emission reporting program called an emissions statement program for VOC and NO_x sources for marginal and above classified ozone nonattainment areas. The required state program and associated regulation defines how states obtain emissions data directly from point source facilities and report it to the USEPA.

N.J.A.C. 7:27-21 requires the submission of annual emission statements from major facilities. From these statements, NJDEP develops reports of emissions of all criteria pollutants, as well as some hazardous air pollutants and greenhouse gases, and submits them to the USEPA pursuant to the federal Air Emission Reporting Requirements (AERR) Rule for inclusion in the USEPA's National Emission Inventory (NEI).

According to the USEPA 70 ppb 8-hour ozone implementation rule[104], if an area has a previously approved emissions statement rule in effect for a previous NAAQS that covers all portions of the nonattainment area, such rule should be sufficient for purposes of the emissions statement requirement. The state should review the existing rule to ensure it is adequate and, if it is, may rely on it to meet the emission statement requirement for the 2015 ozone NAAQS. New Jersey's emission statement rules at N.J.A.C. 7:27-21 were approved for the 1997 85 ppb 8-hour NAAQS on August 3, 2010[105] and were approved for the 2008 75 ppb 8-hour ozone NAAQS on October 9, 2018.[106]

New Jersey certifies that its emissions statement program obligations have been satisfied for the 2015 8-hour ozone NAAQS for the northern and southern nonattainment areas.

4.3 Ozone Season Air Emission Inventories

The CAA 42 U.S.C. §7410(a)(2)(F) (Section 110 (a)(2)(F)) requires the submission by states to the USEPA of periodic reports on the nature and amounts of emissions from pollutants with a NAAQS and emissions related data. CAA 42 U.S.C. §§7511a(1), 7511a(3) and 7502 (Sections 182(a)1, 182(a)(3) and 172(c)(3)) require that states submit periodic emission inventories for marginal and above nonattainment areas in accordance with USEPA guidance.

The USEPA periodic emission inventories or National Emissions Inventories (NEI) and the regional modeling inventories include annual county-level emission inventories for criteria air pollutants and their precursors; NO_x, VOC, CO, PM2.5, PM10, SO_2, NH_3 (and other pollutants such as hazardous air pollutants (HAPs.) The periodic emission inventory requirements and guidance for ozone nonattainment areas, and for Reasonable Further Progress (RFP) demonstrations require peak ozone season (June, July and August for New Jersey) tons per day emissions for ozone precursors VOC, NO_x and CO.[107]

As discussed above, 2016 was chosen as the base emission inventory year for the attainment demonstration and annual modeling inventory. As required by the 70 ppb 8-hour ozone implementation rule[108], 2017 was chosen as the base year for the RFP demonstration. The CAA requires nonattainment areas to demonstrate continued progress (RFP) to attain the ozone standard. CAA section 172(c)(2) requires moderate areas to obtain 15 percent ozone precursor emission reductions over the first 6 years after the baseline year. CAA section 182(c)(2)(B) requires serious and above areas to obtain 18 percent ozone precursor emission reductions in that 6 year period and an additional 3 percent per year reduction until the attainment date.

Based on New Jersey's moderate classification for the 70 ppb 8-hour ozone NAAQS for both its northern and southern nonattainment areas, New Jersey is required to demonstrate RFP compliance by showing greater than 15 percent reduction in ozone precursors from 2017 to 2023. New Jersey submitted a 2017 summer tons per day emission inventory for ozone precursors in the State Implementation Plan Revision dated November 18, 2021[109], which was

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[104] 83 Fed. Reg. 62998 (December 6, 2018)
[105] 75 Fed. Reg. 45483 (August 3, 2010)
[106] 83 Fed. Reg. 50507 (October 9, 2018)
[107] Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, USEPA, May 2017
[108] 83 Fed. Reg. 62998 (December 6, 2018)
[109] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, 2008 75 ppb 8-Hour Ozone Attainment Demonstration, Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control

intended to serve as the base inventory for the RFP demonstration for the 70 ppb 8-hour ozone standard in this SIP.

The onroad and nonroad portions of the 2017 base year inventory are being updated in this SIP to incorporate the latest MOVES model, MOVES3.1 for the base and future year. In the November 18, 2021, SIP, MOVES2014b was used to calculate 2017 and 2020 mobile emissions. In addition, minor updates were made to the area and nonroad inventories due to errors in the summary tables.

As required for RFP, this SIP presents an estimated 2023 projection inventory for ozone precursor summer tons per day emissions. In order to calculate a future projection inventory, the base inventory emissions are grown based on the estimated future activity of the source and then reduced to account for the benefits achieved from any applicable Federal or State control measures between the base and future year. As discussed above, the starting inventory for the 2023 projection inventory is the 2017 actual emission inventory for emissions in summer tons per day of VOC, NO_x, and CO. The projected emission inventories are "grown" from the 2017 actual emission inventory and then "controlled".

The peak ozone season 2023 projection inventories for the New Jersey portions of the Northern NJ-NY-CT Nonattainment Area and Southern NJ-PA-DE-MD Nonattainment Area and their methodologies are discussed in detail in Appendices 4-5 to 4-7. Stationary source (point and area) projection inventories are discussed in Appendix 4-5. The 2023 onroad mobile source projection inventory is discussed in Appendix 4-6. The 2023 nonroad mobile source projection inventory is discussed in Appendix 4-7.

A summary of the 2017 and 2023 peak ozone season emission inventories for the New Jersey portions of the Northern NJ-NY-CT Nonattainment Area and Southern NJ-PA-DE-MD Nonattainment Area is shown in Table 4-1 through 4-6 below. The air emission inventory summaries show overall decreases in VOC, NO_x and CO from 2017 to 2023.

For the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area, VOC emissions are estimated to decrease by 17 summer tpd or 6 percent. NO_x emissions are estimated to decrease by 59 summer tpd or 25 percent. CO emissions are estimated to decrease by 144 summer tpd or 10 percent. For the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area, VOC emissions are estimated to decrease by 13 summer tpd or 9 percent. NO_x emissions are estimated to decrease by 27 summer tpd or 23 percent. CO emissions are estimated to decrease by 76 summer tpd or 11 percent. For both of the New Jersey portions of the Northern NJ-NY-CT and Southern NJ-PA-DE-MD Nonattainment areas, the largest decreases of VOC, NO_x and CO are from the onroad mobile source sector. The inventories are discussed in more detail in Appendices 4-5 to 4-7.

Table 4-7 and Table 4-8 summarize the control measures that result in emission reductions between 2017 (the RFP base year) and 2023 in the New Jersey portions of the Northern NJ-NY-CT Nonattainment Area and Southern NJ-PA-DE-MD Nonattainment Area, respectively, and their emission reductions or benefits.

Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications, and 2017 Periodic Emissions Inventory, November 18, 2021.

Table 4-1:
VOC Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Northern New Jersey-New York-Connecticut Nonattainment Area

County	VOC Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Bergen	2.11	1.84	24.31	24.77	7.22	5.03	7.37	7.00	41.00	38.63	-2.37	-6%
Essex	1.06	1.02	18.31	18.39	4.91	3.26	4.77	4.46	29.05	27.13	-1.92	-7%
Hudson	1.71	1.65	15.60	15.95	2.76	1.97	2.71	2.41	22.78	21.98	-0.80	-4%
Hunterdon	0.13	0.10	4.12	4.05	1.51	1.03	1.77	1.59	7.52	6.76	-0.75	-10%
Middlesex	15.89	14.70	22.85	23.31	6.43	4.35	5.44	5.12	50.62	47.47	-3.15	-6%
Monmouth	0.44	0.41	16.89	17.06	5.15	3.75	5.55	4.96	28.03	26.18	-1.85	-7%
Morris	0.50	0.40	14.35	14.52	3.87	2.62	5.00	4.65	23.72	22.19	-1.53	-6%
Passaic	0.77	0.73	12.34	12.45	3.21	2.18	2.63	2.34	18.95	17.69	-1.26	-7%
Somerset	0.89	0.66	9.62	9.80	2.54	1.72	3.77	3.64	16.83	15.83	-1.00	-6%
Sussex	0.16	0.16	4.00	3.91	1.25	0.84	1.47	1.30	6.88	6.22	-0.66	-10%
Union	3.23	2.93	14.16	14.40	3.88	2.69	3.30	3.20	24.57	23.22	-1.35	-6%
Warren	0.31	0.21	3.43	3.36	1.32	0.86	0.94	0.80	6.00	5.23	-0.78	-13%
Totals	**27.21**	**24.79**	**159.98**	**161.98**	**44.04**	**30.30**	**44.74**	**41.46**	**275.96**	**258.53**	**-17.43**	**-6%**

Notes:

1. Wildfires and prescribed burning are not included.
2. Refueling emissions are included in the Area Source Inventory.

Table 4-2:
VOC Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Southern New Jersey-Pennsylvania-Delaware-Maryland Nonattainment Area

County	VOC Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Atlantic	0.08	0.07	7.47	7.43	2.47	1.73	3.76	2.82	13.79	12.05	-1.74	-13%
Burlington	1.06	0.63	13.96	14.01	4.09	2.91	4.18	3.89	23.28	21.45	-1.84	-8%
Camden	0.67	0.59	13.08	12.81	3.88	2.78	2.57	2.37	20.20	18.56	-1.64	-8%
Cape May	0.08	0.08	3.08	3.05	1.09	0.73	3.86	3.68	8.11	7.54	-0.56	-7%
Cumberland	0.43	0.42	6.27	6.31	1.29	0.92	1.42	1.02	9.40	8.68	-0.72	-8%
Gloucester	5.36	4.36	14.80	14.76	2.48	1.76	2.46	2.24	25.10	23.13	-1.97	-8%
Mercer	0.36	0.33	10.64	10.49	3.10	2.19	2.61	2.43	16.71	15.44	-1.27	-8%
Ocean	0.45	0.50	14.60	14.89	4.76	3.64	6.86	4.73	26.68	23.76	-2.92	-11%
Salem	0.62	0.61	2.79	2.74	0.64	0.46	0.79	0.59	4.84	4.41	-0.43	-9%
Totals	**9.10**	**7.62**	**86.68**	**86.50**	**23.80**	**17.13**	**28.52**	**23.78**	**148.10**	**135.02**	**-13.08**	**-9%**

Notes:

1. Wildfires and prescribed burning are not included.
2. Refueling emissions are included in the Area Source Inventory.

Table 4-3:
NO_x Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Northern New Jersey-New York-Connecticut Nonattainment Area

County	NO_x Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Bergen	2.16	1.73	2.85	2.88	15.80	8.94	10.03	8.00	30.84	21.56	-9.29	-30%
Essex	3.74	4.26	2.28	2.28	11.96	6.54	13.99	13.47	31.96	26.55	-5.42	-17%
Hudson	0.85	0.53	1.81	1.82	6.64	4.40	17.00	15.58	26.30	22.32	-3.98	-15%
Hunterdon	1.36	1.23	0.40	0.38	5.12	3.06	2.66	2.05	9.54	6.72	-2.83	-30%
Middlesex	7.02	4.47	2.55	2.58	19.92	12.14	8.92	6.97	38.41	26.16	-12.25	-32%
Monmouth	0.42	0.43	1.85	1.86	8.71	5.13	10.55	9.08	21.52	16.50	-5.03	-23%
Morris	0.72	0.74	1.79	1.79	9.03	4.95	4.88	3.80	16.42	11.27	-5.15	-31%
Passaic	0.15	0.16	1.26	1.26	5.60	2.91	3.49	2.73	10.50	7.06	-3.44	-33%
Somerset	4.62	4.65	1.17	1.18	6.81	3.87	4.18	3.24	16.78	12.95	-3.83	-23%
Sussex	0.10	0.10	0.43	0.40	1.83	0.91	1.37	0.99	3.73	2.39	-1.34	-36%
Union	8.20	8.67	1.49	1.50	10.10	5.96	6.25	5.65	26.05	21.78	-4.27	-16%
Warren	0.74	0.76	0.31	0.29	5.10	3.02	0.91	0.68	7.05	4.76	-2.29	-33%
Totals	**30.08**	**27.73**	**18.18**	**18.22**	**106.62**	**61.83**	**84.25**	**72.24**	**239.12**	**180.01**	**-59.11**	**-25%**

Notes:
1. Wildfires and prescribed burning are not included.

Table 4-4:
NO_x Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Southern New Jersey-Pennsylvania-Delaware-Maryland Nonattainment Area

County	NO_x Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Atlantic	0.35	0.36	0.82	0.82	6.96	3.68	4.57	3.78	12.70	8.65	-4.06	-32%
Burlington	1.63	1.64	1.33	1.34	9.26	5.06	5.17	4.36	17.40	12.40	-5.00	-29%
Camden	2.27	3.75	1.43	1.44	7.74	4.15	3.88	3.24	15.33	12.57	-2.75	-18%
Cape May	0.11	0.11	0.30	0.30	3.07	1.49	4.29	4.08	7.77	5.98	-1.79	-23%
Cumberland	1.86	2.39	0.43	0.42	3.27	1.84	2.88	2.76	8.43	7.42	-1.02	-12%
Gloucester	5.59	5.27	0.79	0.79	5.64	3.07	3.48	3.13	15.50	12.26	-3.24	-21%
Mercer	1.02	1.04	1.40	1.41	7.13	3.84	4.01	2.88	13.55	9.15	-4.40	-32%
Ocean	2.02	2.40	1.34	1.34	7.54	4.40	6.40	5.12	17.30	13.27	-4.04	-23%
Salem	3.74	3.81	0.20	0.19	1.58	0.83	1.50	1.50	7.02	6.34	-0.68	-10%
Totals	**18.58**	**20.77**	**8.04**	**8.05**	**52.19**	**28.36**	**36.19**	**30.85**	**115.00**	**88.03**	**-26.97**	**-23%**

Notes:
1. Wildfires and prescribed burning are not included.

Table 4-5:
CO Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Northern New Jersey-New York-Connecticut Nonattainment Area

County	CO Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Bergen	0.92	0.82	3.98	4.06	99.39	73.01	144.13	146.38	248.43	224.28	-24.15	-10%
Essex	0.97	0.96	2.97	3.00	67.25	47.67	69.22	70.44	140.42	122.07	-18.35	-13%
Hudson	0.70	0.34	2.16	2.19	31.97	25.25	34.21	34.95	69.05	62.72	-6.32	-9%
Hunterdon	1.90	2.15	1.21	1.20	21.86	16.44	28.63	28.56	53.60	48.34	-5.26	-10%
Middlesex	7.20	7.72	3.45	2.02	97.12	73.95	101.00	102.15	208.76	185.84	-22.92	-11%
Monmouth	0.31	0.31	2.98	3.02	74.78	62.14	88.97	89.20	167.04	154.67	-12.37	-7%
Morris	0.54	0.56	3.02	3.04	55.11	41.07	90.27	91.00	148.93	135.67	-13.26	-9%
Passaic	0.18	0.19	1.79	1.81	40.64	29.05	45.06	45.45	87.66	76.50	-11.16	-13%
Somerset	2.00	2.02	1.83	1.85	36.65	27.83	71.11	71.63	111.59	103.34	-8.26	-7%
Sussex	1.33	1.33	1.48	1.45	15.49	10.70	18.74	18.75	37.03	32.24	-4.79	-13%
Union	2.23	2.14	2.08	2.12	52.14	38.95	60.01	60.82	116.46	104.03	-12.43	-11%
Warren	0.25	0.25	0.98	0.97	19.40	14.38	12.80	12.61	33.42	28.22	-5.20	-16%
Totals	**18.52**	**18.79**	**27.93**	**26.75**	**611.79**	**460.44**	**764.15**	**771.93**	**1,422.39**	**1,277.90**	**-144.49**	**-10%**

Notes:

1. Wildfires and prescribed burning are not included.

Table 4-6:
CO Inventory Summary for 2017 and 2023 by County and Sector
New Jersey Portion of the Southern New Jersey-Pennsylvania-Delaware-Maryland Nonattainment Area

County	CO Emissions (summer tons/day)											
	Point		Area		Onroad		Nonroad		County Totals		Change	Percent Change
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023	2017-2023	2017-2023
Atlantic	0.27	0.28	1.57	1.58	37.41	27.37	34.35	33.42	73.60	62.65	-10.95	-15%
Burlington	1.12	1.14	2.46	2.48	55.14	40.99	57.66	57.90	116.39	102.51	-13.87	-12%
Camden	0.61	0.73	2.12	2.14	49.56	36.22	44.33	44.83	96.63	83.92	-12.71	-13%
Cape May	0.15	0.15	0.62	0.62	16.02	11.48	29.30	33.65	46.10	45.91	-0.19	0%
Cumberland	2.02	4.67	0.98	0.98	16.59	12.54	14.34	13.59	33.93	31.78	-2.14	-6%
Gloucester	2.32	2.09	1.48	1.50	33.95	25.15	38.39	38.54	76.14	67.27	-8.87	-12%
Mercer	0.65	0.66	1.99	2.02	41.96	30.96	45.40	45.47	90.00	79.11	-10.89	-12%
Ocean	2.09	2.75	2.51	2.55	63.85	51.45	62.74	60.41	131.18	117.15	-14.02	-11%
Salem	3.41	3.53	0.54	0.54	9.66	7.04	7.85	7.61	21.46	18.71	-2.75	-13%
Totals	**12.64**	**16.01**	**14.27**	**14.39**	**324.15**	**243.21**	**334.36**	**335.42**	**685.42**	**609.02**	**-76.40**	**-11%**

Notes:
1. Wildfires and prescribed burning are not included.

Table 4-7:
Projected Emissions and Control Measure Benefits Summary
New Jersey Portion of Northern New Jersey-New York-Connecticut Nonattainment Area

Federal or State	Control Measure	NJAC	USEPA Approval	Pollutants	2017 Inventory		2023 Projection Inventory	
					VOC tpd	NO_x tpd	VOC tpd	NO_x tpd
Non-EGU Point Sources								
Non-EGU Point Source Control Measure Benefits, post 2017								
State	Permitting/Nonattainment New Source Review (NNSR)	7:27-8,18, 22	NA	All	NQ	NQ	NQ	NQ
State	Petroleum Storage Tanks	7:27-16.2	08/03/10	VOC	NA	NA	1.07	NA
State	Stationary Natural Gas Compressor Turbines and Engines	7:27-19.5, 19.8	10/09/18	NO_x	NA	NA	NA	0.28
State	Surface coating CTGs (Fiberglass Boat Manufacturing Material, Metal and Plastic Parts Coatings, Paper, Film, and Foil Coatings)	7:27-16.7,16.14,16.15	10/09/18	VOC	NA	NA	1.34	NA
Federal	Natural Gas Turbine NSPS NO_x control compliance date 1/1/2023	NA	NA	NO_x	NA	NA	NA	0.03
Federal	Petroleum Refineries NSPS	NA	NA	VOC	NA	NA	0.35	NA
Total Non-EGU Point Source Control Measure Benefits, post 2017					**NA**	**NA**	**2.76**	**0.31**
Non-EGU Point Source Emissions, Growth Only					**NA**	**NA**	**27.12**	**19.87**
NON-EGU Point Source Emissions Grown and Controlled					**26.72**	**19.45**	**24.36**	**19.56**
EGU Point Sources								
EGU Point Source Control Measure Benefits, post 2017								
Federal	EGU: CSAPR	NA	NA	NO_x	NA	NA	NQ	NQ
Total EGU Point Source Control Measure Benefits, post 2017					**NA**	**NA**	**NA**	**NA**
EGU Point Source Emissions Grown and Controlled					**0.49**	**10.63**	**0.43**	**8.17**
Area Sources								
Area Source Control Measures Benefits, post 2017								
State	Portable Fuel Containers	7:27-24	7/22/10	VOC	NA	NA	0.69	NA
Federal	Residential Woodstove NSPS	NA	NA	All	NQ	NQ	NQ	NQ
Federal	RICE MACT	NA	NA	All	NA	NA	0.01	NA
Total Area Source Benefits, post 2017					NA	NA	**0.70**	**0.00**
Area Source Emissions, Growth Only					**NA**	**NA**	**162.68**	**18.22**
Area Source Emissions Grown and Controlled					**159.98**	**18.18**	**161.98**	**18.22**

Table 4-7 (continued)
Projected Emissions and Control Measure Benefits Summary
New Jersey Portion of Northern New Jersey-New York-Connecticut Nonattainment Area

Federal or State	Control Measure	NJAC	USEPA Approval	Pollutants	2017 Inventory		2023 Projection Inventory	
					VOC tpd	NO_x tpd	VOC tpd	NO_x tpd
Onroad Sources								
Onroad Source Control Measures, post 2017								
State	IM: Diesel Smoke Cutpoint	NJAC 7:27-14	3/9/2023	All	NA	NA	NQ	NQ
State	New Jersey Low Emission Vehicle (LEV) Program	NJAC 7:27-29	2/13/2008	All	NA	NA	Note 1	Note 1
Federal	Heavy-Duty Vehicle Standards and Diesel Fuel Sulfur Control	NA	NA	All	NA	NA	Note 1	Note 1
Federal	National Low Emission Vehicle Program (NLEV)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Tier 1, 2 and 3 Vehicle Program	NA	NA	All	NA	NA	Note 1	Note 1
Federal	GHG Emission Standards for Passenger Cars and Light Trucks Through Model Year 2026	NA	NA	All	NA	NA	NQ	NQ
Total Onroad Control Measure Benefits, post 2017					NA	NA	**13.74**	**44.79**
Onroad Emissions, Grown and Controlled					**44.04**	**106.62**	**30.30**	**61.83**
Nonroad Sources								
Nonroad Source Control Measures, post 2017								
Federal	Diesel Compression Ignition Engines	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Diesel Marine Engines over 37 kW	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Large Industrial Spark-Ignition Engines over 19 kW (>50 hp)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Recreational Vehicles (Snowmobiles, Off-road Motorcycles, All-terrain Vehicles)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Spark Ignition Engines, Equipment, and Vessels at or below 19 kW (Lawn and Garden and Small Watercraft)	NA	NA	All	NA	NA	Note 1	Note 1
Total Nonroad Control Measure Benefits, post 2017					**NA**	**NA**	**3.30**	**16.00**
Nonroad Emissions, Grown and Controlled					**44.74**	**84.25**	**41.46**	**72.24**
All Sectors								
TOTAL BENEFITS, post 2017					**NA**	**NA**	**20.50**	**61.10**
TOTAL EMISSIONS, Grown and Controlled					**275.97**	**239.13**	**258.53**	**180.01**

Notes:

NA = Not Applicable

NQ = Not Quantified, not included in the benefit total

1. Included in total, not quantified individually
2. Wildfires and prescribed burning are not included.

All = NO_x, VOC, CO, PM2.5, PM10

Table 4-8:
Projected Emissions and Control Measure Benefits Summary
New Jersey Portion of Southern New Jersey-Pennsylvania-Delaware-Maryland Nonattainment Area

Federal or State	Control Measure	NJAC	USEPA Approval	Pollutants	2017 Inventory		2023 Projection Inventory	
					VOC tpd	NO_x tpd	VOC tpd	NO_x tpd
Non-EGU Point Sources								
Non-EGU Point Source Control Measure Benefits, post 2017								
State	Permitting/Nonattainment New Source Review (NNSR)	7:27-8,18, 22	10/09/18	All	NQ	NQ	NQ	NQ
State	Petroleum Storage Tanks	7:27-16.2	08/03/10	VOC	NA	NA	0.22	NA
State	Surface coating CTGs (Fiberglass Boat Manufacturing Material, Metal and Plastic Parts Coatings, Paper, Film, and Foil Coatings)	7:27-16.7,16.14,16.15	10/9/2018	VOC	NA	NA	1.21	NA
Federal	Petroleum Refineries NSPS	7:27-16.2	NA	VOC	NA	NA	0.28	NA
Federal	Process Heater NSPS	NA	NA	NO_x	NA	NA	NA	0.03
Total Non-EGU Point Source Control Measure Benefits, post 2017					**NA**	**NA**	**1.71**	**0.03**
Non-EGU Point Source Emissions, Growth Only							**9.03**	**13.32**
NON-EGU Point Source Emissions Grown and Controlled					**8.86**	**13.09**	**7.32**	**13.29**
EGU Point Sources								
EGU Point Source Control Measure Benefits, post 2017								
Federal	EGU: CSAPR	NA	NA	NO_x	NA	NA	NQ	NQ
Total EGU Point Source Control Measure Benefits, post 2017					**NA**	**NA**	**0.00**	**0.00**
EGU Point Source Emissions Grown and Controlled					**0.24**	**5.49**	**0.29**	**7.49**
Area Sources								
Area Source Control Measures Benefits, post 2017								
State	Portable Fuel Containers	7:27-24	7/22/10	VOC	NA	NA	0.32	NA
Federal	Residential Woodstove NSPS	NA	NA	All	NQ	NQ	NQ	NQ
Federal	RICE MACT	NA	NA	All	NA	NA	0.00	NA
Total Area Source Benefits, post 2017					**NA**	**NA**	**0.33**	**0.00**
Area Source Emissions, Growth Only					**NA**	**NA**	**86.82**	**8.05**
Area Source Emissions Grown and Controlled					**86.68**	**8.04**	**86.50**	**8.05**

Table 4-8 (continued)
Projected Emissions and Control Measure Benefits Summary
New Jersey Portion of Southern New Jersey-Pennsylvania-Delaware-Maryland Nonattainment Area

Federal or State	Control Measure	NJAC	USEPA Approval	Pollutants	2017 Inventory (Note 1)		2023 Projection Inventory	
					VOC tpd	NO_x tpd	VOC tpd	NO_x tpd
Onroad Sources								
Onroad Source Control Measures, post 2017								
State	IM: Diesel Smoke Cutpoint	NJAC 7:27-14	3/9/2023	All	NA	NA	NQ	NQ
State	New Jersey Low Emission Vehicle (LEV) Program	NJAC 7:27-29	2/13/2008	All	NA	NA	Note 1	Note 1
Federal	Heavy-Duty Vehicle Standards and Diesel Fuel Sulfur Control	NA	NA	All	NA	NA	Note 1	Note 1
Federal	National Low Emission Vehicle Program (NLEV)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Tier 1, 2 and 3 Vehicle Program	NA	NA	All	NA	NA	Note 1	Note 1
Federal	GHG Emission Standards for Passenger Cars and Light Trucks Through Model Year 2026	NA	NA	All	NA	NA	NQ	NQ
Total Onroad Control Measure Benefits, post 2017					**NA**	**NA**	**6.67**	**23.84**
Onroad Emissions, Grown and Controlled					**23.80**	**52.19**	**17.13**	**28.36**
Nonroad Sources								
Nonroad Source Control Measures, post 2017								
Federal	Diesel Compression Ignition Engines	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Diesel Marine Engines over 37 kW	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Large Industrial Spark-Ignition Engines over 19 kW (>50 hp)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Recreational Vehicles (Snowmobiles, Off-road Motorcycles, All-terrain Vehicles)	NA	NA	All	NA	NA	Note 1	Note 1
Federal	Spark Ignition Engines, Equipment, and Vessels at or below 19 kW (Lawn and Garden and Small Watercraft)	NA	NA	All	NA	NA	Note 1	Note 1
Total Nonroad Control Measure Benefits, post 2017					**NA**	**NA**	**4.80**	**6.82**
Nonroad Emissions, Grown and Controlled					**28.52**	**36.19**	**23.78**	**30.85**
All Sectors								
TOTAL BENEFITS, post 2017					**NA**	**NA**	**13.51**	**30.69**
TOTAL EMISSIONS, Grown and Controlled					**148.10**	**115.00**	**135.02**	**88.03**

Notes:

NA = Not Applicable

NQ = Not Quantified, not included in the benefit total

1. Included in total, not quantified individually

2. Wildfires and prescribed burning are not included.

All = NO_x, VOC, CO, PM2.5, PM10

Chapter 5 REASONABLE FURTHER PROGRESS (RFP)

5.1 RFP Introduction

This chapter describes the methodologies and calculations used to show that New Jersey meets requirements for reasonable further progress (RFP).

The CAA requires nonattainment areas to demonstrate continued progress to attain the ozone standard. The 2018 70 ppb 8-Hour Ozone Implementation Rule[110] defines reasonable further progress (RFP) as the emissions reductions required under CAA Section 172(c)(2) and contains requirements and guidance on how to demonstrate RFP for the 2015 70 ppb standard. For the purposes of the 2015 70 ppb ozone NAAQS, for areas with an approved 1-hour or 1997 85 ppb 8-hour ozone NAAQS 15 percent VOC Rate of Progress (ROP) plan that are classified as moderate or higher, such as New Jersey, the USEPA is interpreting CAA Section 172(c)(2) to require moderate areas to obtain 15 percent ozone precursor emission reductions over the first 6 years after the baseline year. Under the CAA Section 172(c)(2) and CAA Section 182(c)(2)(B) RFP requirements, NO_X emission reductions could be substituted for VOC reductions.

For the 2015 70 ppb 8-hour ozone NAAQS, the USEPA is recommending that states use as the baseline year for RFP, the calendar year for the most recently available triennial emission inventory at the time the RFP plan is developed, 2017 in this instance. For a multistate nonattainment area, all states associated with the nonattainment area must consult and agree on the same year to use as the baseline year for RFP. New Jersey and the other states in both the Northern NJ-NY-CT and Southern NJ-PA-MD-DE Nonattainment Areas are using 2017 as the baseline year for RFP.

The Ozone Implementation Rule requires that the creditable emission reductions for fixed percentage reduction RFP must be obtained from sources within the nonattainment area. Additionally, states do not have to perform emission reduction calculations for the following four types of pre-1990 non-creditable control measure emission reductions listed under CAA Section 182(b)(1)(D)(i) for exclusion from the RFP analysis:

1. Federal Motor Vehicle Control Program (FMVCP) tailpipe and evaporative standards applicable as of January 1, 1990;
2. Federal regulations limiting the Reid Vapor Pressure (RVP) of gasoline in ozone nonattainment areas applicable as of June 15, 1990;
3. State regulations correcting deficiencies in reasonably available control technology (RACT) rules; and
4. State regulations establishing or correcting inspection and maintenance (IM) programs for onroad vehicles.

In addition, CAA Sections 172(c)(9) and 182(c)(9) and the Ozone Implementation Rule require that the SIPs for all 8-hour ozone nonattainment areas include contingency measures for RFP. Contingency measures are additional controls needed to further reduce emissions in the event an area fails to meet an RFP milestone or fails to attain by its attainment date. These contingency measures must be fully adopted rules or measures that are ready for implementation quickly without further action by the State or the USEPA upon failure to meet an RFP milestone or reach attainment. As discussed in more detail in Chapter 9, since attainment cannot be demonstrated for the Northern NJ-NY-CT nonattainment area, contingency measures cannot be developed for that area.

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[110] 83 Fed. Reg. 63033 (December 6, 2018).

As also discussed in more detail in Chapter 9, both the RFP and attainment contingency requirement for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area will be met with a combination of VOC and NO_x emission reductions by removing safety margins from the transportation conformity motor vehicle emission budgets. RFP calculations are shown below for the Southern NJ-PA-MD-DE below both with and without the safety margins factored into the onroad inventory. Contingency measures for RFP and attainment for the New Jersey portion of the nonattainment areas are discussed further in Chapter 9.

New Jersey has elected to establish RFP target levels comprised of 1/3 VOC reductions and 2/3 NO_x reductions. While both pollutants contribute to ozone formation, modeling data indicates that currently NO_x reductions are more effective at reducing ozone formation in both of New Jersey's nonattainment areas, while VOC reductions were more effective at the time the CAA was written.

5.2 RFP Calculations

This section describes the calculations performed to determine compliance with RFP requirements. The RFP calculations are shown in Table 5-1 for the New Jersey portion of the Northern NJ-NY-CT nonattainment area and in Table 5-2 for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area. Table 5-3 shows the RFP scenario if contingency measures are triggered. The steps described below correspond with the rows in both tables.

Step 1: Calculate the 2017 base year anthropogenic emission inventory for the peak ozone season (tons per summer day.) This inventory does not include biogenic emissions.

Step 2: Calculate the RFP emission reduction required (percent).

Step 3: Calculate the RFP-required VOC and NO_x target emission reductions (tons per summer day) by multiplying the 2017 base year emissions in Row 1 by the percent reduction in Row 2.

Steps 4 through 8: The actual 2017 and the projected (grown and controlled) VOC and NO_x inventories for the 2023 peak ozone season (tons per summer day) are presented by emission sector in Rows 4 through 7 and totaled in Row 8. The inventories are derived as discussed in Chapter 4.

Step 9: Calculate the RFP target emissions for 2023 by subtracting the emission reductions in Row 3 from the 2017 actual emissions in Row 1.

Steps 10 and 11: The VOC and NO_x emission reductions are presented in tons per summer day in Row 10 and as a percentage of the 2017 base year inventory in Row 11.

Step 12: The RFP % emission reductions achieved for 2023 are calculated as the sum of the VOC and NO_x emission reductions from the 2017 base year inventory.

Table 5-1:
Rate of Further Progress
New Jersey Portion of Northern NJ-NY-CT Nonattainment Area

ROW		2017		2023	
		Inventory		Projection	
		VOC	NO_x	VOC	NO_x
		tpd	tpd	tpd	Tpd
1	**2017 Base Year Emissions**	276	239		
2	**RFP % Reduction Required 2023:(VOC+NO_x=15%)**			**5%**	**10%**
3	**RFP Target Emission Reductions**			**14**	**24**
4	Point Emissions	27	30	25	28
5	Area Emissions	160	18	162	18
6	Onroad Emissions	44	107	30	62
7	Nonroad Emissions	45	84	41	72
8	**Total Emissions**			**259**	**180**
9	**RFP Target Emissions**			262	215
10	**Achieved Emission Reductions**			17	59
11	**% Emission Reductions Achieved**			6%	25%
12	**RFP % Emission Reductions Achieved (VOC + NO_x)**			**31%**	

Table 5-2:
Rate of Further Progress
New Jersey Portion of Southern NJ-PA-MD-DE Nonattainment Area
Motor Vehicle Emission Budgets with Safety Margins

ROW		2017		2023	
		Inventory		Projection	
		VOC	NO_x	VOC	NO_x
		tpd	tpd	tpd	tpd
1	**2017 Base Year Emissions**	148	115		
2	**RFP % Reduction Required 2023:(VOC+NO_x=15%)**			**5%**	**10%**
3	**RFP Target Emission Reductions**			**7**	**12**
4	Point Emissions	9	19	8	21
5	Area Emissions	87	8	86	8
6	Onroad Emissions	24	52	19	32
7	Nonroad Emissions	29	36	24	31
8	**Total Emissions**			**137**	**91**
9	**RFP Target Emissions**			141	104
10	**Achieved Emission Reductions**			11	24
11	**% Emission Reductions Achieved**			7%	20%
12	**RFP % Emission Reductions Achieved (VOC + NO_x)**			**28%**	

Table 5-3:
Contingency Measures Rate of Further Progress
New Jersey Portion of Southern NJ-PA-MD-DE Nonattainment Area
Motor Vehicle Emission Budgets with Safety Margins Removed

ROW		2017		2023	
		Inventory		Projection	
		VOC	NO_x	VOC	NO_x
		tpd	tpd	tpd	tpd
1	**2017 Base Year Emissions**	148	115		
2	**RFP % Reduction Required 2023:(VOC+NO_x=15%)**			**5%**	**10%**
3	**RFP Target Emission Reductions**			**7**	**12**
4	Point Emissions	9	19	8	21
5	Area Emissions	87	8	86	8
6	Onroad Emissions	24	52	17	28
7	Nonroad Emissions	29	36	24	31
8	**Total Emissions**			**135**	**88**
9	**RFP Target Emissions**			141	104
10	**Achieved Emission Reductions**			13	27
11	**% Emission Reductions Achieved**			9%	23%
12	**RFP % Emission Reductions Achieved (VOC + NO_x)**			**32%**	

5.3 RFP Summary and Conclusions

As shown in Table 5-1, the percent reduction of VOC and NO_x from the 2017 baseline to 2023 is 31 percent, which exceeds the RFP-required 15 percent, for the New Jersey portion of the Northern NJ-NY-CT nonattainment area. The total emissions for 2023 are less than the RFP target emissions for 2023. Therefore, the New Jersey portion of the Northern NJ-NY-CT nonattainment area meets and exceeds the RFP requirement for 2017.

As shown in Table 5-2, the percent reduction of VOC and NO_x from the 2017 baseline to 2023 is 28 percent, which exceeds the RFP-required 15 percent, for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area. The total emissions for 2023 are less than the RFP target emissions for 2023. Therefore, the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area meets and exceeds the RFP requirement for 2017. Table 5-3 shows the same RFP calculations if contingency measures are needed to reach attainment and shows the New Jersey portion of the Southern NJ-PA-MD-DE area would further exceed the RFP requirement for 2017 if contingency measures are used.

Chapter 6 ATTAINMENT DEMONSTRATION

6.1 Introduction

This chapter summarizes the results of the regional photochemical modeling for ozone conducted by the Ozone Transport Commission (OTC) Modeling Centers (including NJDEP), and other data and factors influencing air quality that are not included in the modeling. Attainment demonstration conclusions incorporate regional air quality monitoring, control measures and air emission inventories discussed in previous chapters, as well as ozone contributions from upwind transport.

USEPA's "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze" dated November 2018 (hereafter referred to as the USEPA 2018 Modeling Guidance), recommends that the following be included in the technical documentation:

- Overview of the air quality issue being considered including historical background;
- List of the planned participants in the analysis and their expected roles;
- Schedule for completion of key steps in the analysis and final documentation;
- Description of the conceptual model for the area;
- Description of periods to be modeled, how they comport with the conceptual model, and why they are sufficient;
- Models to be used in the demonstration and why they are appropriate;
- Description of model inputs and their expected sources (e.g., emissions, met, etc.);
- Description of the domain to be modeled (expanse and resolution);
- Process for evaluating base year model performance (meteorology, emissions, and air quality) and demonstrating that the model is an appropriate tool for the intended use;
- Description of the future years to be modeled and how projection inputs will be prepared;
- Description of the attainment test procedures and (if known) planned weight of evidence;
- Expected diagnostic or supplemental analyses needed to develop weight of evidence analyses.

These items are summarized briefly below and discussed in detail in the OTC Modeling Technical Support Documents (TSDs), 2016 based inventory platform, included in Appendix 4-1A and 4-1B:

> Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union, 2016 Based Modeling Platform Support Document, Ozone Transport Commission, 1st Version, January 31, 2023;
>
> Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union, 2016 Based Modeling Platform Technical Support Document: OTC V2/V3 Modeling Platform Update, Ozone Transport Commission, July 14, 2023;

6.2 The Conceptual Model – The Nature of the Ozone Air Quality Problem in the Northeast

As recommended in the USEPA 2018 Modeling Guidance, the first step in developing an attainment demonstration should be to construct a conceptual description of the problem that is being addressed. Conceptual descriptions, which are also referred to as conceptual models, are comprehensive summaries of the "state of the knowledge" regarding the influence of emissions, meteorology, transport, and other relevant atmospheric processes on air quality in the area.

As discussed in the OTC Modeling TSD, the interaction of meteorology, chemistry, and topography lead to a complex process of ozone formation and transport. Ozone episodes in the Ozone Transport Region (OTR) often begin with an area of high pressure setting up over the southeast United States. These summertime high-pressure systems can stay in place for days or weeks. This scenario allows for stagnant surface conditions to form in the OTR, and, in turn, the transported pollution mixes with local pollution in the late morning hours as the nocturnal inversion breaks down. With a high-pressure system in place, the air mass, which is characterized by generally sunny and warm conditions, exacerbates ozone concentrations. This meteorological setup promotes ozone formation, as sunlight, warm temperatures, and ozone precursors (nitrogen oxides (NO_x) and volatile organic compounds (VOCs)) interact chemically to form ozone. In addition, ozone precursors and ozone are transported into the OTR during the late night and/or early morning hours from the areas to the southwest of the OTR by way of the nocturnal low-level jet (NLLJ), a
fast-moving river of air that resides approximately 1,000 meters above the surface. All this local and transported polluted air can, in some instances, accumulate along the coastal OTR areas as the air is kept in place due to onshore bay and sea breezes.

Some ozone is natural, or transported internationally, leading to ozone that is not considered relatable to US human activity. This US background ozone in the eastern United States is estimated to be in the range of 30 to 35 ppb though it can be as high as 50 ppb in the Intermountain West (US EPA 2014).

Another complexity involves the nonlinear relationship between NO_x and VOC concentrations and ozone formation. Areas that have extensive forests that produce high levels of isoprene and other VOCs during the summer months more readily control ozone through reductions in regional NO_X emissions. This is the case in the majority of the landscape in the OTR. Conversely, dense urban areas such as New York City, that have low natural VOC production, may more readily benefit locally from VOC emission reductions. In other cases, excess NO_x is available to destroy already formed ozone. The phenomenon is known as titration and in areas where this occurs, such as New Haven harbor, reductions of NO_x can increase ozone levels.

To address the complexity of ozone formation and transport that occurs in the OTR, the 2016-based modeling year was selected as representative of the conceptual model as described in “The Nature of the Ozone Air Quality Problem in the Ozone Transport Region: A Conceptual Description” (Downs et al. October 2010).

6.3 The Contribution of Transport to Nonattainment

6.3.1 Background

In addition to local sources of air pollution, air pollution transported hundreds of miles from distant sources in and outside the OTR, contribute to ozone pollution in New Jersey and its multi-state nonattainment areas. Transport of air pollution is an important factor in understanding how ground-level ozone is produced and what geographical areas influence ozone production. During ozone events, high levels of ozone impact over 200,000 square miles across the eastern United States from beyond the OTR’s borders.

There are three meteorological mechanisms that contribute to the transport of air pollution into and within the Ozone Transport Region: ground level transport, transport by the nocturnal low-level jet, and westerly transport aloft.

Ground-level transport is the result of interaction between the broad meteorological features and local effects, such as sea breeze and the Appalachian lee side trough.

Transport within the OTR can also occur via the nocturnal low-level jet that forms late at night or in the very early morning hours. The nocturnal low-level jet is a regional scale phenomenon of higher wind speeds that often form a few hundred meters above the ground just above the stable nocturnal boundary layer. This phenomenon is a result of the differential heating of the air between the Appalachian Mountains and the Atlantic Ocean. The land, sea, mountain, and valley breezes can selectively affect relatively local areas and they play a vital role in drawing ozone-laden air into some areas, such as coastal areas, that are far removed from major emission source regions. The nocturnal low-level jet can transport ozone that formed within the OTR to other areas, can transport ozone formed outside the region into the OTR or can move locally formed ozone within the confines of the OTR. It extends the entire length of the Northeast corridor from Virginia to Maine and has been observed as far south as Georgia.

Finally, westerly transport aloft is dominated by the anti-cyclonic flow around a high-pressure system, which can lead to transport of an ozone reservoir, created by emissions in areas that lie outside the OTR, into the OTR. Local emissions within the OTR add to the polluted air mixing down from above that arrived from more distant locations.

6.4 Photochemical Modeling and Inputs

6.4.1 Introduction

The CAA and Federal regulations[111] require that states use photochemical grid modeling, or any other analytical method determined by the Administrator to be at least as effective as photochemical grid modeling as part of their demonstration of attainment of the ozone NAAQS by the required attainment date. The USEPA 2018 Modeling Guidance also recommends this approach. Therefore, New Jersey's attainment demonstration includes photochemical grid modeling. The regional modeling was conducted in accordance with the USEPA 2018 Modeling Guidance.

6.4.2 Air Quality Model: CMAQ

As recommended in the USEPA 2018 Modeling Guidance, the photochemical model selected for the attainment modeling demonstration was the USEPA's Models-3/Community Multi-Scale Air Quality (CMAQ) Model version 5.3.3. Photochemical modeling was performed with the CMAQ Chemical-Transport Model (CCTM) software that is part of the CMAQ modeling package.

The CMAQ modeling system was selected for the attainment demonstration primarily because it is a photochemical grid model capable of modeling a variety of pollutants over a range of time and space scales, i.e., a "one-atmosphere" photochemical grid model. The CMAQ model is peer reviewed, and has been validated and widely used by Federal, state, and local government, as well as research institutes and universities. Not only is CMAQ used to model ozone by OTC, but it is also being used to model particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$) and Regional Haze in the Northeast.

The CMAQ model requires specific inputs, including meteorological information and emissions information. The remainder of this section discusses, in general, the data inputs for the CMAQ model, the CMAQ model parameters chosen for the modeling runs, validation of the CMAQ model and the results of the modeling.

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[111] 42 U.S.C. § 7511a(c)(2)(A) and 40 CFR §51.908(c).

6.4.3 Regional Modeling Coordination

Under the coordination of the OTC Modeling Committee, several states and modeling centers performed regional modeling runs and/or contributed to the preparation of technical information for the regional modeling effort. Those organizations included:

1) the New York State Department of Environmental Conservation (NYSDEC);
2) the New Jersey Department of Environmental Protection;
3) the Virginia Department of Environmental Quality;
4) the Maryland Department of the Environment and the University of Maryland; and
5) the Mid-Atlantic Regional Air Management Agency (MARAMA).

The lead agency for coordinating regional air quality modeling efforts and performing base year and future year CMAQ model runs for this ozone attainment demonstration was the NYSDEC. The NYSDEC ran the CMAQ model using the protocol discussed below and in the OTC Modeling TSDs, and performed post-processing of the results, including calculating the projected ozone design values using the relative response factor (RRF) method specified in the USEPA 2018 Modeling Guidance.

6.4.4 Regional Emission Inventories and Control Measures

As discussed in more detail in Chapter 4, the regional modeling air emission inventories used in the photochemical modeling for this SIP are based on the USEPA, State and Local, 2016 based modeling platform inventory collaborative. The modeling in this SIP utilizes a 2016 base year, specifically 2016 version 2 (2016v2) and version 3 (2016v3) hybrid, with an emission projection to 2023. The modeling includes the 2016v2 modeling platform updated with the early release of 2016v3 emissions for commercial marine vessels (CMV) and solvents. In addition, Ozone Transport Commission (OTC)-specific inventories for electric generating units (EGUs) with projections using ERTAC and associated changes to nonERTAC EGU point sources were used instead of point source emissions from the USEPA modeling platform which uses the Integrated Planning Model (IPM) for EGUs.

The USEPA SMOKE Version 4.8.1 model was used to process the air emissions inventory to prepare them for input into the CMAQ model.

A detailed description of the development of the 2016 and 2023 air emissions modeling inventories is included in Chapter 4. A detailed description of the control measures in the inventory is included in Chapter 3.

6.4.5 Meteorology Data

As discussed in Chapter 4, 2016 was designated as the base year for this 8-hour ozone attainment demonstration. The regional modeling used meteorological data from USEPA's 2016 platform photochemical modeling of the Continental/Contiguous United States (CONUS). The USEPA CONUS domain used the meteorological field generated by Weather Research and Forecasting (WRF) v3.8. OTC retained the same 12 km square grid size and 35 layer column depth as was used by USEPA.

6.4.6 Episode Selection

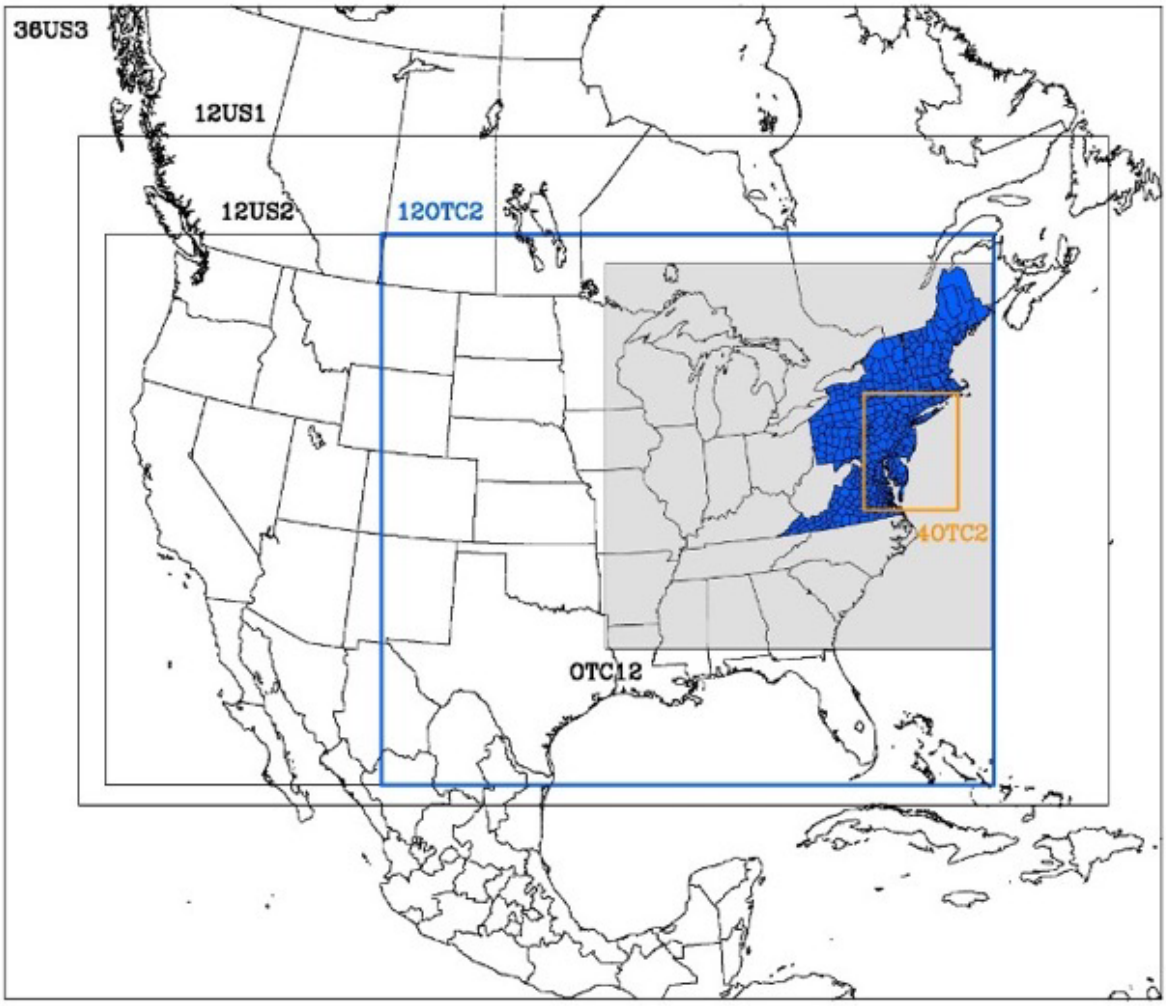
The ozone season, April 1 to October 30, was simulated for the 2016 and 2023 modeling runs (with 2016 meteorology conditions). As a result, the total number of days examined for the complete ozone season far exceeds the USEPA 2018 Modeling Guidance and provides for better assessment of the simulated pollutant fields.

6.4.7 Modeling Domain

In defining the modeling domain, one must consider the location of the local urban area, the downwind extent of the elevated ozone levels, the location of large emission sources, and the availability of meteorological and air quality data. The domain or spatial extent to be modeled includes as its core the nonattainment area. Beyond this, the domain includes enough of the surrounding area such that major upwind sources fall within the domain and the emissions produced in the nonattainment area remain within the domain throughout the day.

The modeling domain used in this platform represents a subset of the larger USEPA continental modeling domains ("12US1" and "12US2") that cover the contiguous U.S. The OTC modeling domain at 12 km horizontal grid resolution ("12OTC2"), outlined in blue, is displayed in Figure 6-1. The 12 km by 12 km domain used in this analysis includes 38 full states (including DC) and four partial states (MT, WY, CO, and NM) from 110.17°W to 65.0931°W and 23.0019°N to 51.8794°N, which includes some portions of southern Canada and northern Mexico. The domain is 273 columns by 246 rows in the horizontal and 35 vertical layers—the same as the Weather Research Forecast (WRF) model—from the surface to 50 mb.

Figure 6-1: OTC 12-Kilometer CMAQ Modeling Domain



6.4.8 Horizontal Grid Size

The basic CMAQ modeling platform utilized a 12 km horizontal grid resolution for the CONUS domain. A larger domain was selected for the WRF simulations to provide a buffer of several grid cells around each boundary of the CMAQ 36 km domain. This was designed to minimize any errors in the meteorology from boundary effects. A 12 km inner domain (12OTC2) was selected to better characterize air quality in the OTR Region and surrounding Regional Planning Organization regions. The horizontal grid definitions for the CMAQ and WRF modeling domains are discussed in the OTC Modeling TSDs.

6.4.9 Vertical Resolution

The vertical grid used in the CMAQ modeling was primarily defined by the WRF vertical structure. The WRF model employed a terrain-following coordinate system defined by atmospheric pressure. The atmosphere was resolved with 35 vertical layers up to 50 mb, with the thinnest layers being nearest the surface to better resolve the planetary boundary layer (PBL). All layers were left undisturbed in moving from the WRF to the CMAQ simulation. This ensures that the near-surface processes that affect air pollution the most are represented realistically, while the meteorological systems that are driven by upper level winds are allowed to develop properly. The vertical layer definitions and other details related to the WRF and CMAQ modeling domains are discussed in the OTC Modeling TSDs.

6.4.10 Initial and Boundary Conditions

For 2016v1 modeling a new set of boundary and initial conditions were created by NYSDEC running CMAQv5.3.1 at the 36US3 domain with USEPA “fh” emissions. Boundary and initial conditions for the 36US3 domain were obtained from the USEPA’s hemispheric 108 km CMAQ (H-CMAQ) platform downloaded from the Intermountain West Data Warehouse. The 3-D fields from the 36US3 simulation provided boundary and initial conditions for the 12OTC2 CMAQ simulation.

For 2016v2 boundary conditions for 2023 were updated from an in-house 36 km by 36 km contiguous U.S. domain using USEPA 2016v2 emissions and USEPA-produced boundary conditions from the hemispheric CMAQ model.

6.5 Photochemical Modeling Results

6.5.1 Relative Response Factor (RRF)

The USEPA 2018 Modeling Guidance recommends the use of a modeled attainment test, which is described as a procedure in which an air quality model is used to simulate current and future air quality. For this modeled attainment test, model estimates are used in a “relative” rather than “absolute” sense. The ratio of the model’s future year to baseline year ozone estimates are calculated at each ozone monitor. These ratios are called Relative Response Factors (RRF). RRF’s are calculated with CMAQ output from the maximum modeled ozone of a 3X3 array of grid cells centered on the location of the monitor using the following equation:

> RRF = (average future year ozone over the highest 10 modeled ozone days selected based on base year ozone concentrations) / (average base year ozone over the highest 10 modeled ozone days)

More detail regarding RRF calculations is provided in the OTC Modeling TSDs.

6.5.2 Baseline Design Values

The baseline design values used in modeling are calculated differently from the monitored design values used for NAAQS compliance, although both are based on monitored ambient air quality data. For modeling purposes, the USEPA 2018 Modeling Guidance recommends that the baseline design value is calculated by averaging three air quality compliance design value periods, centered around the base inventory year. Since the baseline design value is the anchor point for the future year projected concentrations it is believed that the average of the three design value periods best represents the baseline concentrations, while taking into account the variability of the meteorology and emissions (over a five-year period).

Specifically, the average modeling baseline design value (DVB) is the average of three consecutive design values starting with the design value of the baseline year. For this platform the average DVB is the average of the "2016 DV" (determined from 2014-2016 observations), the "2017 DV" (determined from 2015-2017 observations), and the "2018 DV" (determined from 2016-2018 observations). Consequently, the average DVB is derived from observations covering a five-year period with 2016 observations "weighted" three times, 2015 and 2017 observations weighted twice, and 2014 and 2018 observations weighted once.

6.5.3 Modeling Results

Future estimated ozone design value concentrations are calculated for each monitoring site by multiplying the modeled RRF by the baseline ozone design values to obtain the future estimated value. Design values are truncated in accordance with 40 CFR Part 50.10, Appendix I.

A summary of the modeling design value results compared to the latest air quality monitoring design values is shown below in Tables 6-1 and 6-2, for the Northern and Southern nonattainment areas, respectively. For more details regarding the modeling results see the OTC Modeling TSD.

Table 6-1:
Ozone Design Value Modeling vs Monitoring Summary
Northern NJ-NY-CT Nonattainment Area

8-hour Ozone Design Values (ppb)							
Site Name	AQS Code	County	State	Modeling		Monitoring	
				2016	2023	2022	2023 Prelim
Westport (Sherwood)	090019003	Fairfield	CT	82.7	77.4	80	82
Greenwich	090010017	Fairfield	CT	79.3	75.5	77	79
Madison (Hammonasset)	090099002 (formerly 090093002)	New Haven	CT	79.7	72.8	79	79
Susan Wagner/Fresh Kills	360850111 (formerly 360850067)	Richmond	NY	76	70.7	66	69
White Plains	361192004	Westchester	NY	74	70.5	68	69
Middletown (CVH)	90079007 (formerly 090070007)	Middlesex	CT	78.7	69.6	73	75
Stratford (USGS Lighthouse)	090013007	Fairfield	CT	82	69.5	81	82
Criscuolo Park	090090027	New Haven	CT	75.7	69.5	70	70
Babylon	361030002	Suffolk	NY	74	69.5	74	75
Danbury (Western Conn Univ)	090011123	Fairfield	CT	77	69.3	71	73
Leonia	340030006	Bergen	NJ	74.3	68.7	68	70
Riverhead	361030004	Suffolk	NY	74.3	67.8	68	68
Queens	360810124	Queens	NY	72.3	67.4	70	72
Rutgers University	340230011	Middlesex	NJ	74.7	66.9	68	71
Pfizer Lab	360050133	Bronx	NY	70.7	66.3	69	70
Bayonne	340170006	Hudson	NJ	71	66.1	66	67
Convent Av (CCNY)	360610135	New York	NY	70.3	65.6	70	71
Holtsville	361030009	Suffolk	NY	71	65	70	69
South Mountain Rd (Rockland County)	360870005	Rockland	NY	71.3	64.7	62	66
Flemington	340190001	Hunterdon	NJ	71.3	63.3	62	67
IS52	360050110	Bronx	NY	67.7	63.2	66	67
Newark Firehouse	340130003	Essex	NJ	68.3	61.8	64	No Data
Chester	340273001	Morris	NJ	69	61.2	62	65
Ramapo	340315001	Passaic	NJ	67.7	60.5	60	63
Monmouth University	340250005	Monmouth	NJ	67.3	59.1	67	70
Columbia	340410007	Warren	NJ	64.3	55	58	58
Flax Pond	361030044	Suffolk	NY	No Data	No Data	No Data	73

Notes:

1. Modeling:

OTC modeling file 20221222_DVF2023_2016V2V3fj_CMAQ_CAMx_v3cmv.newv3solvents.ertacfix229_RCU
Dated 12/22/2022
OTC 2016 modeling platform version 2/3 hybrid including version 3 solvents and Revised CSAPR Update

Photochemical Grid Model:	CMAQ 5.3.3	Biogenic Model:	BEIS V3.7 with updated BELD
Horizontal Grid Mesh:	12OTC2	Boundary Conditions:	USEPA 36-km CMAQ
Grid Cells:	273x246	Gas Phase Chemistry:	CB6r3
Vertical Grid Mesh:	35 Layers	Emissions Inventory:	2016V2V3_fj with ERTAC EGU
Meteorological Model:	WRF V3.8	Includes Revised CSAPR Update?	Yes

2. Modeling 2016 base design value is a 5 year average from 2014 to 2018.
3. Monitoring design values are the three year average of the fourth highest ozone value.
4. 2023 preliminary data as of 12/18/23

Legend

	Greater than 75
	Greater than 70

Table 6-2:
Ozone Design Value Modeling vs Monitoring Summary
Southern NJ-PA-DE-MD Nonattainment Area

8-hour Ozone Design Values (ppb)							
Site Name	AQS Code	County	State	OTC Modeling		Monitoring	
				2016	2023	2022	2023 Prelim w EE
Bucks (BRIS)	420170012	Bucks	PA	79.3	70.2	72	73
Philadelphia (NEA)	421010024	Philadelphia	PA	77.7	69	70	70
Camden Spruce St	340070002	Camden	NJ	75.3	67.2	64	67
Philadelphia (NEW)	421010048	Philadelphia	PA	75.3	66.9	68	70
Clarksboro	340150002	Gloucester	NJ	73.7	65.8	66	70
New Castle (BCSP)	100031010	New Castle	DE	73.7	65.5	59	63
Washington Crossing	340219991	Mercer	NJ	73.3	65.5	65	67
Colliers Mills	340290006	Ocean	NJ	72.7	64.6	66	70
Cecil (Fair Hill)	240150003	Cecil	MD	74	64.4	65	67
Montgomery (NORR)	420910013	Montgomery	PA	71.3	64	67	67
Chester (NEWG)	420290100	Chester	PA	72.7	63.8	60	63
Delaware (CHES)	420450002	Delaware	PA	71.3	63.4	65	69
Rider University	340210005	Mercer	NJ	71.3	63.3	69	69
New Castle (MLK)	100032004	New Castle	DE	71.3	63.1	60	62
New Castle (BELLFNT2)	100031013	New Castle	DE	71	62.8	59	No Data
Ancora State Hospital	340071001	Camden	NJ	67.3	59.2	61	63
New Castle (LUMS 2)	100031007	New Castle	DE	68	58.9	62	66
Brigantine	340010006	Atlantic	NJ	63.7	58.4	59	59
Millville	340110007	Cumberland	NJ	65.7	58.1	63	65
Kent (KILLENS)	100010002	Kent	DE	66.3	58	60	62
Sussex (LEWES)	100051003	Sussex	DE	67.7	55.1	58	No Data
Philadelphia (LAB)	421010004	Philadelphia	PA	61	54.2	64	63
Sussex (SEAFORD)	100051002	Sussex	DE	65.3	No Data	58	62
Philadelphia (BAX)	421011002	Philadelphia	PA	No Data	No Data	No Data	No Data

Notes:

1. Modeling:

OTC modeling file 20221222_DVF2023_2016V2V3fj_CMAQ_CAMx_v3cmv.newv3solvents.ertacfix229_RCU
Dated 12/22/2022
OTC 2016 modeling platform version 2/3 hybrid including version 3 solvents and Revised CSAPR Update

Photochemical Grid Model:	CMAQ 5.3.3	Biogenic Model:	BEIS V3.7 with updated BELD
Horizontal Grid Mesh:	12OTC2	Boundary Conditions:	USEPA 36-km CMAQ
Grid Cells:	273x246	Gas Phase Chemistry:	CB6r3
Vertical Grid Mesh:	35 Layers	Emissions Inventory:	2016V2V3_fj with ERTAC EGU
Meteorological Model:	WRF V3.8	Includes Revised CSAPR Update?	Yes

2. Modeling 2016 base design value is a 5 year average from 2014 to 2018.
3. Monitoring design values are the three year average of the fourth highest ozone value.
4. 2023 preliminary data as of 12/18/23, includes Exceptional Event (EE) data

Legend

	Greater than 75
	Greater than 70
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6.6 Unmonitored Area Analysis

The USEPA 2018 Modeling Guidance and ozone implementation rules recommend an unmonitored area analysis to examine ozone and/or PM2.5 concentrations in unmonitored areas. The unmonitored area analysis is intended to be a means for identifying high ozone and/or PM2.5 concentrations outside of traditionally monitored locations, particularly in nonattainment areas where modeling or other data analyses have indicated potential high concentration areas of ozone and/or PM2.5 outside of the existing monitoring network. The "unmonitored area analysis" describes an analysis that uses a combination of model output and ambient data to identify areas that might exceed the NAAQS in areas that are not currently monitored. The analysis should include, at a minimum, all nonattainment counties and counties surrounding the nonattainment area, as appropriate.

An unmonitored area analysis was performed for New Jersey's multi-state nonattainment areas and included in New Jersey's Ozone Attainment Demonstration SIP revision, submitted on October 29, 2007.[112] This analysis concluded that all areas of maximum ozone concentration in the ozone nonattainment areas associated with New Jersey are adequately reflected by the monitoring locations and the modeling performed. This analysis is also applicable to this demonstration, as the monitored areas are the same. In addition, New Jersey's monitored locations far exceed that of USEPA's minimum requirements and there is no reason to believe there are areas with potentially high concentrations that are not already reflected in the existing monitoring network.

6.7 Model Performance Quality Assurance Evaluation

The USEPA 2018 Modeling Guidance states that "a model performance evaluation should be considered prior to using modeling to support an attainment demonstration" (USEPA, 2018). Specifically, at least a complete operational evaluation should be conducted, while diagnostic evaluation, dynamic evaluation, and probabilistic evaluation are encouraged.

The model performance quality assurance evaluation is included in the OTC Modeling TSD.

In summary, various analyses are presented in the TSD to assess the predictions of ozone and precursors from both CMAQ and CAMx. Overall, both models' performances meet criteria set out by USEPA for SIP Quality Modeling allowing the states to use it to support SIPs and estimate future ozone concentrations. Both models generally capture the day-to-day and diurnal variations in ozone, however, they tended to generally underpredict ozone early in the season and overpredict later in the season. Across much of the domain, CAMx generally predicted higher ozone than CMAQ, except at some coastal sites with substantial overprediction in CMAQ. The performance of the CMAQ model at 12 km resolution decreased along the coastal areas, in particular the Connecticut coastline.

[112] State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard 8-Hour Ozone Attainment Demonstration, The State of New Jersey Department of Environmental Protection, October 29, 2007.

6.8 Model Results Evaluation and Uncertainties

Sea and Bay Breeze Effect

The highest monitored 8-hour ozone design values in the Northern NJ-NY-CT Nonattainment Area are at Stratford and Westport, followed closely by Madison and Greenwich, all in Connecticut, based on 2022 monitoring data. All of these monitors are located in close proximity to a major highway, I-95, and are directly downwind of the major metropolitan area of New York City, which makes them heavily influenced by local transported air pollutants. Additionally, all of these sites are situated on the perimeter of the Long Island Sound making them susceptible to a bay breeze effect that is similar to a sea breeze effect.

Field studies and numerical modeling efforts around the country and internationally have shown that a sea breeze circulation can influence local ozone concentrations.[113,114,115,116,117,118,119] A sea breeze may exacerbate air pollution levels by constricting horizontal and vertical ventilation, and re-circulating air that would otherwise move offshore. On other occasions, a sea breeze may move relatively clean air onshore, which will rapidly lower ozone concentrations. The Maryland Department of the Environment examined the theoretical impact of the Chesapeake Bay breeze on the ozone monitor site in Edgewood, Maryland.[120] The conclusions of this analysis were that a local-scale sea breeze circulation can exacerbate peak ozone concentrations not only during regional-scale high ozone episodes, but also during periods when local scale circulation is more significant than regional transport.

Evaluation of modeling data shows that CMAQ does not always accurately predict ozone concentrations at monitors on the land/water interface. As discussed in the 2018 MANEVU Modeling TSD, when monitors are located so as to result in one or more of the eight additional grid cells overlaying a body of water OTC has found that those monitors are often not responsive to changes in emissions. Research conducted by the University of Maryland on the calculation of future design values has demonstrated some potential flaws with USEPA

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[113] Seaman, N. L. and Michelson, S.A. Mesoscale Meteorological Structure of a High-Ozone Episode during the 1995 NARSTO-Northeast Study. *Journal of Applied Meteorology*, 39, 384-398, 1998.
[114] McElroy, M.B. and Smith, T.B. Vertical Pollutant Distributions and Boundary Layer Structure Observed by Airborne LIDAR near the Complex California Coastline. *Atmospheric Environment*, 20, 1555-1566, 1986.
[115] Bornstein, R.D., Thunis, P., and Schayes, G. Simulation of Urban Barrier Effects on Polluted Urban Boundary-Layers Using the Three Dimensional URBMET/TVM Model with Urban Topography-New Results from New York City. In: Zanetti, P. (Ed), Air Pollution, Computational Mechanics Publications, Southampton, Boston, 15-34, 1993.
[116] Cheng, W. L. Ozone Distribution in Coastal Central Taiwan under Sea-Breeze Conditions. *Atmospheric Environment*, 36, 3445-3459, 2002.
[117] Boucouvala, D. and Bornstein, R. Analysis of Transport Patterns during an SCOS97-NARSTO Episode. *Atmospheric Environment*, 37(S2), S73-S94, 2003.
[118] Martilli, A., Roulet, Y.A., Junier, M., Kirchner, F., Mathias, W. R., and Clappier, A. On the Impact of Urban Surface Exchange Parameterizations on Air Quality Simulations: The Athens Case. *Atmospheric Environment*, 37, 4217-4231, 2003.
[119] Evtyugina, M. G., Nunes, T., Pio, C., and Costa, C. S. Photochemical Pollution under Sea Breeze Conditions, during Summer, at the Portuguese West Coast. *Atmospheric Environment*, 40, 6277-6293, 2006.
[120] Maryland Department of the Environment. Appendix G-11: The Role of Land-Sea Interactions on Ozone Concentrations at the Edgewood, Maryland Monitoring Site, Cecil County, Maryland 8-Hour Ozone State Implementation Plan and Base Year Inventory. Maryland Department of the Environment, June 15, 2007.

modeling guidance in regards to calculating RRFs for these particular monitors.[121] It is often the case that due to slower dry deposition of ozone, fewer clouds being over bodies of water, Planetary Boundary Layer (PLB) (also known as the atmospheric boundary layer (ABL) venting, PBL height, and emissions from marine vessels, the ozone measurements are much higher over bodies of water than nearby land masses. As a result, the maximum values in the 3x3 grid occur in a grid cell over water where ozone pollution is higher and less responsive to changes in emissions.

Electric Generation on High Electric Demand Day (HEDD)

It is difficult to accurately represent the effects of electric generating units (EGU) in photochemical modeling. Great strides have been accomplished in recent years by using the ERTAC EGU program and upgrading to hourly temporal profiles in the modeling. Actual continuous emission monitoring (CEM) of hourly data is used for the EGU temporal profiles. For the 2016 base year, EGU actual hourly emissions from CAMD are input into the modeling. However, the effect of peaking, electric generating unit emissions on hot summer days, which usually coincide with elevated levels of ozone, is still difficult to accurately portray when modeling over the entire ozone season. The effect of the emissions from power plants on these peak days is most likely underpredicted in the CMAQ modeling.

A study of the August 2003 Northeast Blackout demonstrated the effect of what happened when electric power was not being generated.[122] University of Maryland flight data collected 24 hours into the Northeast Blackout showed that ozone was 30 ppb lower throughout the 0.5-1.5 km section of the atmosphere and 38 ppb lower at ground level, than on a meteorologically similar day. When the ozone levels on the blackout day were compared to a reference day it was shown that the blackout caused a drop of at least 7 ppb ozone, and likely considerably more. However, a modeling study of the same event using CMAQ predicted only a 2 ppb change.[123] These results demonstrated that CMAQ greatly under predicted the ozone reductions achieved when the power generating plants were not operating by a factor of approximately 3. However as stated above, improvements in EGU inputs in the modeling have been made since this analysis.

Distributed Generation/Demand Response

Distributed Generation/Demand Response (DG/DR) (also known as behind-the-meter electricity generation or back-up generators) is electric power generated from small, stationary, reciprocating internal combustion engines (RICE) fueled by natural gas, diesel fuel, or gasoline that are used during emergencies in New Jersey. However, in some states these engines are also used to assist the electric grid during high electric demand periods. New Jersey's rules for stationary RICE (or emergency generators) do not allow the use of uncontrolled engines for the purpose of demand response/distributed electric generation. Some other states in New Jersey's multi-state nonattainment areas allow this type of emissions. The emissions from these units are not properly accounted for in states inventories, nor in the USEPA National Emissions Inventory (NEI) due to lack of data on the sources. It is difficult to quantify these

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[121] Goldberg, DL, CP, Tzortziou, M, Stehr, JW, Pickening, KE, Morufu, LT and Dickerson RR 2014, 'Higher surface ozone concentrations over the Chesapeake Bay than over the adjacent land: Observations and models from Discover-AQ and CBODAQ campaigns', Atmospheric Environment, vol. 84 pp, 9-19.

[122] Marufu, L.T., Taubman, B. F., Bloomer, B., Piety, C. A., Doddridge, B. G., Stehr, J. W., and Dickerson, R. R. The 2003 North American Electrical Blackout: An Accidental Experiment in Atmospheric Chemistry. *Geophysical Research Letters*, 31, L13106, 2004.

[123] Hu, Y., Odman, M. T., and Russell, A. G. Re-examination of the 2003 North American Electrical Blackout Impacts on Regional Air Quality. *Geophysical Research Letters*, 33, 2006.

emissions as they are not always reported to the states and many are in the area source inventory, which is based on statewide fuel consumption, not unit specific emissions. Similar to HEDD EGUs, many of these engines operate on hot summer days that typically coincide with the high ozone days.

In general, DG/DR units were originally installed to provide power to a facility in the event that service from the electrical grid was interrupted (e.g., due to a grid failure or natural disaster). However, there has been increased use of these units as part of financial incentive programs to reduce grid electricity use during times of high demand (generally referred to as Demand Response (DR) programs). According to the Federal Energy Regulatory Commission (FERC), DR is the reduction of energy consumption by customers in response to the increased price of electricity or in response to financial incentives to reduce electric demand.[124]

In addition to the emissions not being properly accounted for in state and Federal inventories, the temporal profiles used in the emissions model for many area source categories tend to distribute emissions evenly over the year. This could also lead to an underestimate of emissions due to DG/DR units operating on a peak electric demand day.

The OTC HEDD Workgroup performed a review of state rules and regulations that pertain to the participation of emergency generators in demand response programs.[125] They determined that in most states an engine that participates in a voluntary demand response program or other supply arrangement with a utility or system operator is considered a non-emergency engine. On April 15, 2016, the USEPA provided its "Guidance on Vacatur of RICE NESHAP and NSPS Provisions for Emergency Engines". This guidance clarified and modified the USEPA's requirements concerning the participation of generation resources in non-emergency programs. The guidance specifies that the previous allowance for emergency engines to operate when an Energy Emergency Alert (EEA) Level 2 has been declared, or when there are specific voltage or frequency deviations, is vacated as of May 2, 2016. The USEPA further clarifies that any such operation for these purposes would be considered non-emergency operation after this date. While it is not known whether USEPA's requirements were the cause, there was a noticeable decrease in the amount of generating resources that cleared the PJM auction for DR participation between 2015 and 2016 in the OTC workgroup analysis.

An emission analysis was also conducted for these units by the OTC workgroup. The estimated emissions show a potentially significant amount of emissions from these units in the New York City Metropolitan/Long Island area on peak ozone days in the range of 2 to 3 tons per day. On March 11, 2020, New York adopted regulation, 6 NYCRR Part 222, that establishes performance standards for distributed generation sources with a compliance date of May 1, 2021. The implementation of this rule in New York will contribute to the attainment of the 70 ppb ozone standard in the Northern NJ-NY-CT Nonattainment Area.

6.9 Control Measures Not Included in the Photochemical Modeling

A weight of evidence (WOE) analysis is a supplemental analysis to support SIP modeling attainment demonstration results. Guidance for what may be included in a WOE analysis can be found in the USEPA 2018 Modeling Guidance. In some cases, a single modeling demonstration may not be appropriate as the determining factor in demonstrating whether an area will attain the NAAQS by the attainment date or when an area will attain the NAAQS.

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[124] NESCAUM. Air Quality, Electricity, and Back-up Stationary Diesel Engines in the Northeast; Northeast States for Coordinated Air Use Management, Boston, MA, 2014.

[125] OTC Stationary and Area Source Committee, HEDD Workgroup White Paper: Examining the Air Quality Effects of Small EGUs, Behind the Meter Generators, and Peaking Units during High Electric Demand Days, 11/10/16.

Depending on the results of the SIP modeling attainment demonstration, a state may choose to perform a WOE analysis to support the SIP modeling. A WOE analysis may include, but is not limited to, emissions reductions and control measures that were not included in the modeling and actual monitored design values.

New Jersey has adopted or implemented additional measures that have not been included in the air quality modeling, which are discussed below. These measures provide additional VOC and NO_x emission reductions that contribute towards the goal of attainment of the ozone NAAQS. Some will provide benefits starting after the August 3, 2024, attainment date as summarized in Chapter 3, Table 3-3

6.9.1 Quantified Control Measures

Phase I and II Gasoline Vapor Recovery 2017 Amendments

As discussed in more detail in Chapter 3, New Jersey adopted amendments to its Gasoline Transfer Operations rules, effective November 20, 2017, and operative on December 23, 2017, with compliance dates ranging from one to seven years from the operative date. The Department estimates that the requirements for a CARB-certified Phase I Enhanced Vapor Recovery (EVR) system, including the CARB-certified pressure/vacuum valve and a dual-point vapor balance system for new gasoline dispensing facilities, will result in an emission reduction of approximately 5 tons per day (tpd) of VOCs. It is estimated that the requirements for dripless enhanced conventional (ECO) nozzles and low permeation hoses will result in an emission reduction of approximately 3.5 tpd of VOCs.

State Voluntary Mobile Measures

As discussed in more detail in Chapter 3, New Jersey has implemented several transportation programs and initiatives such as the New Jersey Clean Construction Program, Marine Ferry Repower Program, Forklift Replacements, EMS Idle Reduction Program and USEPA Diesel Emission Reduction Act (DERA) Retrofit and Replacements and Marine Repowers programs. These programs are estimated to achieve approximately 2,295 tons of NO_x and 183 tons of particulate matter.

6.9.2 Non-Quantified Control Measures

IM: Diesel Smoke Cutpoint

As discussed in Chapter 3, the NJDEP adopted amendments to N.J.A.C. 7:27-14.2, 14.4, 14.6, and 7:27B-4.5 on April 3, 2009, which reduce the allowable smoke from heavy-duty diesel vehicles during inspections. Smoke opacity, which is used as a surrogate for particulate matter, is the degree to which a plume of smoke will obstruct transmission of visible light. Newer trucks are equipped with emission control equipment that reduces the exhaust emissions. Smoke opacity is an indicator that maintenance is needed.

State Voluntary Mobile Measures

As discussed in more detail in Chapter 3, and in addition to the programs with estimated emission reductions discussed above, New Jersey has implemented several transportation programs and initiatives such as Transportation Control Measures (TCMs), Transportation Management Associations (TMAs), North Jersey Transportation Planning Authority Transportation Clean Air Measures and the PA-NY-NJ Cargo Handling Equipment program.

Federal GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026

As discussed in Chapter 3, on December 30, 2021, USEPA finalized federal greenhouse gas (GHG) emissions standards for new passenger cars and light trucks for Model Years (MY) 2023 through 2026. The final standards leverage advances in clean car technology to unlock $190 billion in net benefits to Americans, including reducing climate pollution, improving public health, and saving drivers money at the pump. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and are based on sound science and grounded in a rigorous assessment of current and future technologies. The updated standards will result in avoiding more than 3 billion tons of GHG emissions through 2050 with co-benefits of reducing the ozone precursors NO_x and VOCs.

Federal Good Neighbor Plan

As discussed in more detail in Chapter 8, on June 5, 2023, the USEPA published its final Good Neighbor Plan entitled "Federal 'Good Neighbor Plan' for the 2015 Ozone National Ambient Air Quality Standards" effective August 4, 2023, which secures reductions in ozone-forming emissions of NO_x from power plants and industrial facilities.

6.9.3 Control Measures with Benefits Starting After the 2023 Ozone Season

EGU Emission Limits

As discussed in Chapter 3, on December 2, 2022, NJDEP adopted rules that set new Electric Generating Unit (EGU) emission limits starting June 1, 2024. These rules are being submitted for inclusion into New Jersey's SIP as discussed in Chapter 3, Section 3.2.

Advanced Clean Trucks (ACT)

As discussed in Chapter 3, on November 1, 2021, NJDEP adopted rules based on California's Advanced Clean Trucks regulations requiring increasing sales fractions of medium and heavy-duty trucks be zero emission vehicles (ZEVs). The requirements of this rule are identical to the California Advanced Clean Trucks rule and will be effective starting with model year 2025.

Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards

As discussed in Chapter 3, on December 29, 2022, NJDEP adopted rules that require diesel mobile cargo handling equipment at ports and intermodal rail yards to meet performance standards that reflect best available control technology, with a compliance date in 2025.

#4 and #6 Fuel Oil Ban

As discussed in Chapter 3, on December 2, 2022, NJDEP adopted rules banning #4 and #6 fuel oil, with a compliance date in 2025 with a two year sell through period. These rules are being submitted for inclusion into New Jersey's SIP as discussed in Chapter 3, Section 3.2.

IM: Heavy Duty On-board Diagnostics (OBD)

As discussed in Chapter 3, the NJDEP adopted amendments to N.J.A.C. 7:27–14, 15, and N.J.A.C. 7:27B-4, B-5 on September 9, 2016, which added on-board diagnostic (OBD) inspection and maintenance requirements for heavy duty vehicles. OBD equipment monitors the status of vehicle emission controls and engine performance, alerting the driver via a

dashboard indicator if there is a vehicle malfunction. The rules require heavy duty vehicles with OBD systems installed, model years 2014 and newer, to pass an OBD inspection every year for commercial vehicles and every two years for passenger vehicles. The estimated start date of the program is in 2026.

Medium Duty Diesel Vehicles (MDDVs) IM

As discussed in Chapter 3, on April 21, 2023, NJDEP adopted amendments that include a medium duty diesel inspection and maintenance program. The program establishes emission inspection procedures and standards for diesel vehicles with a GVWR greater than 8,500 and less than 14,001 pounds. The estimated start date of the program is in 2026.

Advanced Clean Cars II

As discussed in Chapter 3, on November 21, 2023, NJDEP adopted rules based on California's Advanced Clean Cars II (ACC II) regulations requiring manufacturers of passenger cars and light-duty trucks to meet an annual zero-emission vehicle (ZEV) requirement. Additionally, the regulation includes more stringent multi-pollutant exhaust emission standards that manufacturers of internal combustion engine passenger cars, light-duty trucks, and medium-duty vehicles must meet. The requirements begin with model year 2027.

As discussed in more detail in Chapter 3, prior to and in addition to the adoption of ACCII New Jersey has taken significant actions regarding electric vehicles that will help New Jersey's goal of ozone attainment now and far into the future.

Heavy Duty New Engine Standards (Omnibus)

As discussed in Chapter 3, on April 21, 2023, NJDEP adopted rules based on California's Omnibus regulations that require manufacturers selling new gasoline and diesel-powered vehicles rated in excess of 8,500 pounds gross vehicle weight rating (GVWR) in New Jersey to comply with the California emission standards for NO_x. The requirements begin with model year 2027.

Federal Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards

As discussed in Chapter 3, on December 20, 2022, USEPA adopted a final rule, "Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards," that sets stronger emissions standards to further reduce air pollution, including the ozone precursors (NO_x and VOCs) and particulate matter, from heavy-duty vehicles and engines starting in model year 2027. The final program includes more stringent emissions standards that cover a wider range of heavy-duty engine operating conditions compared to previous standards, and it requires the more stringent emissions standards to be met for a longer period of time when these engines operate on the road.

Federal Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-duty and Medium-Duty Vehicles

As discussed in Chapter 3, on April 12, 2023, USEPA announced a proposal for new, more ambitious proposed standards to further reduce harmful air pollutant emissions from light-duty and medium-duty vehicles starting with model year 2027. The proposal builds upon USEPA's final standards for federal greenhouse gas emissions standards for passenger cars and light trucks for model years 2023 through 2026 and leverages advances in clean car technology to unlock benefits to Americans ranging from reducing climate pollution, to improving public health,

to saving drivers money through reduced fuel and maintenance costs. The proposed standards would phase in over model years 2027 through 2032. The standards will reduce GHGs, VOCs, NO_x and PM2.5. USEPA finalized the regulations on March 20, 2024.

Federal Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3

As discussed in Chapter 3, on April 12, 2023, EPA announced a proposal for more stringent standards to reduce greenhouse gas emissions from heavy-duty (HD) vehicles beginning in model year (MY) 2027. The new standards would be applicable to HD vocational vehicles (such as delivery trucks, refuse haulers, public utility trucks, transit, shuttle, school buses, etc.) and tractors (such as day cabs and sleeper cabs on tractor-trailer trucks). Specifically, EPA is proposing stronger CO2 standards for MY 2027 HD vehicles that go beyond the current standards that apply under the HD Phase 2 Greenhouse Gas program. EPA is also proposing an additional set of CO2 standards for HD vehicles that would begin to apply in MY 2028, with progressively lower standards each model year through 2032. The standards will reduce GHGs, VOCs, NO_x, PM and SO_2. USEPA finalized the regulations on April 27, 2024.

Regional Haze "Asks"

As discussed in Chapter 3, the Federal Clean Air Act sets a national goal to restore visibility to its natural conditions in many of the national parks and wilderness areas in the United States of America. New Jersey is home to one of these areas, the Brigantine Wilderness Area in the Edwin B. Forsythe National Wildlife Refuge. Additional measures to control air pollution, in New Jersey and other states within its shared ozone nonattainment area, as well as upwind contributing states, have occurred as part of states' Regional Haze State Implementation Plans (SIPs) for the first implementation planning period of 2008-2018. States in the MANEVU region are currently in various stages of developing Regional Haze SIPs for the second implementation planning period of 2018 -2029. New Jersey submitted its final Regional Haze SIP to USEPA on March 26, 2020. Included in the Regional Haze SIP was a list of "asks" for states that contribute to visibility impairment to consider undertaking as air pollution control measures in their Regional Haze SIPs. The "asks" addressed emissions of sulfur dioxide (SO_2) and NO_x from states within and outside of the MANEVU Region.

The "asks" include more stringent controls for electric generating units (EGUs) including peaking combustion turbines, evaluation of emission sources to determine reasonable installation or upgrade of emission controls, adoption of MANEVU's 2007 ultra-low sulfur fuel oil standard, locking in lower emission rates by updating of permits, enforceable agreements, and/or rules, and increased use of energy efficiency measures and other clean technologies including fuel cells, wind, and solar.

The "asks" also include a request for the Federal Land Managers consult with MANEVU Class I area states when scheduling prescribed burns, and USEPA to develop measures that will further reduce emissions from heavy-duty onroad vehicles and ensure that Class I Area state "Asks" are addressed by states identified as significantly contributing to MANEVU Class I areas.

6.10 Attainment Demonstration Summary

Northern NJ-NY-CT Nonattainment Area

The attainment modeling did not predict attainment of the 2015 70 ppb 8-hour ozone NAAQS for the Northern NJ-NY-CT Nonattainment Area for the 2023 ozone season. The modeling predicted noncompliance at three monitors located in Connecticut and two monitors in New York. All of the monitors in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area were predicted to be in compliance with 70 ppb standard.

The ambient air monitoring for the Northern NJ-NY-CT Nonattainment Area is measuring noncompliance with the 70 ppb standard at seven monitors based on the 2022 monitoring design values and 11 monitors based on the preliminary 2023 monitoring design values. For the 2022 ozone season, all of the noncomplying monitors are located in Connecticut except one in New York. All of the monitors in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area are in compliance with 70 ppb standard for the 2022 ozone season. As discussed in Chapter 2, the area experienced significant air pollution due to smoke from Canadian wildfires in 2023, therefore, the 2023 data is not representative of ambient conditions. For the 2023 ozone season, there were six noncomplying monitors in Connecticut, four noncomplying monitors in New York and one noncomplying monitor in New Jersey. The highest concentrations were in the Connecticut monitors. The New Jersey Rutgers monitor was only slightly over the standard at 71 ppb, which was most likely influenced by smoke from the significant wildfires.

As shown in Chapter 2, 8-hour ozone design values in New Jersey have decreased approximately 48 percent from 1988-2022. An all-time low design value of 68 ppb was calculated in 2022 in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area. The maximum 8-hour ozone design values in the Northern NJ-NY-CT Nonattainment Area have decreased approximately 24 percent from 1999-2022. The maximum design values for the nonattainment area show a slight decreasing trend of approximately 5 percent from 2014 to 2022. However, the maximum design values in the New Jersey portion of the northern area from 2014 to 2022 show a decreasing trend of approximately 8 percent.

Southern NJ-PA-DE-MD Nonattainment Area

The attainment modeling did predict attainment of the 2015 70 ppb 8-hour ozone NAAQS for the Southern NJ-PA-DE-MD Nonattainment Area for the 2023 ozone season. The highest monitor was predicted to be 70 ppb at the Pennsylvania Bucks monitor. However, the ambient air monitoring for the Southern NJ-PA-DE-MD Nonattainment Area is measuring noncompliance with the 70 ppb standard with a design value of 72 ppb at the Pennsylvania Bucks monitor in 2022 and 73 ppb at the same monitor in 2023. As discussed in Chapter 2, the area experienced significant ozone air quality impacts due to smoke from the wildfires in 2023, therefore, the data is not representative of ambient conditions.

All of the monitors in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area are in compliance with 70 ppb standard since 2020, including the 2023 ozone season, even with the exceptional event data from the significant wildfires included. As shown in Chapter 2, 8-hour ozone design values in New Jersey have decreased approximately 48 percent from 1988-2022. An all-time low design value of 69 ppb was calculated in 2021 and 2022 in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area.

The maximum 8-hour ozone design values in the Southern NJ-PA-DE-MD Nonattainment Area have decreased approximately 35 percent from 1999-2022. The design values for the southern area increased from 72 ppb to 73 ppb from 2022 to preliminary 2023, with the exceptional

events included in 2023. The maximum design values for the nonattainment area show a decreasing trend of approximately 6 percent from 2014 to 2022 and 5 percent from 2014 to preliminary 2023. However, the maximum design values in the New Jersey portion of the southern area from 2014 to 2022 show a decreasing trend of approximately 9 percent. The annual 4th high ozone concentration in the area reached an all-time low in 2022 of 70ppb. The annual 4th high was 74 ppb in preliminary 2023 with exceptional events included.

6.11 Attainment Plan Conclusions

New Jersey has met its obligation for implementing control measures to address its contribution to ozone nonattainment within the nonattainment areas. The decreasing trends in emissions and monitoring values demonstrate the effectiveness of New Jersey's rules. New Jersey has met Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT) requirements and has gone beyond RACM and RACT by adopting control measures more stringent than Federal rules, Control Technique Guidelines (CTGs) and neighboring state rules, especially those of most importance that address NO_x on high ozone days, thereby setting the standard for what modern RACT should be. Most specifically are New Jersey's rules for:

Power Plants

New Jersey has enforceable, short term, performance standards for NO_x and VOC emissions from power plants (or EGUs) that are among the most stringent and effective air pollution control regulations in the country. New Jersey took the lead in adopting measures to address emissions from EGUs that operate on HEDDs when ozone concentrations tend to be elevated. These sources are critically important contributors to episodes of elevated ozone in the Northern NJ-NY-CT Nonattainment Area.

All major facility permits for new EGU sources issued by the Department limit NO_x emissions based on hourly or daily averaging times, which are monitored by continuous emissions monitors (CEMs) and stack testing. These shorter averaging times lower NO_x emissions on a daily basis during the summertime, when they are needed most to control outdoor ozone levels, while still meeting an annual or ozone season cap. New Jersey's EGU rules include similar short-term emission limits for existing sources of NO_x, including all existing coal, oil and gas fired EGU's. Due to several New Jersey control measures that addressed pollution from EGUs in New Jersey, the final three coal EGUs in New Jersey ceased operation in 2022.

New Jersey's EGU rules more effectively control ozone levels than certain USEPA rules, such as CSAPR Trading Programs, because New Jersey's facilities must meet daily NO_x performance standards for all units, while facilities in other states may, under the Federal rules, purchase allowances to cover their excess emissions on high energy demand days. New Jersey's daily enforceable emission limitations better address ozone nonattainment than emission trading programs that allow the averaging of NO_x emissions over the entire summer. Five-month compliance periods are insufficient to ensure attainment of the ozone NAAQS because emissions can be high on days when ozone levels are high. Five-month averaging does not sufficiently lower emissions on the hottest summer days when peak electric demand and peak ozone levels usually occur. Unlike other states that significantly impact New Jersey's air quality, New Jersey power plants cannot turn off their NO_x pollution controls and use excess NO_x allowances to meet emission limits.

USEPA's CSAPR ozone season trading programs are inadequate to address NO_x emissions from HEDD units that are preferentially used on high temperature, high ozone

days. New Jersey has reduced NO_x emissions from power plants an estimated 64 tons per day on HEDD since implementation of the rule, with Phase I in 2009 and Phase II in 2015.

Distributed Generation/Demand Response (DG/DR)

New Jersey's rules for stationary reciprocating internal combustion engines (RICE) do not allow the use of uncontrolled engines for the purpose of distributed electric generation or demand response in non-emergency situations. However, in some states these engines are uncontrolled and used to assist the electric grid during high electric demand periods. The emissions from these units are not properly accounted for in states inventories, or in the USEPA National Emissions Inventory (NEI) and they are not properly temporalized in the modeling. Like HEDD EGUs, many of these engines operate on hot summer days, which usually coincide with the high ozone days. Emissions from these units in the New York City Metropolitan/Long Island area on peak ozone days may be significantly contributing to ozone formation.

New Jersey Mobile Source Controls

New Jersey has also done its part to address emissions from mobile sources to the extent that state action on mobile source control measures is not pre-empted by the Clean Air Act. New Jersey has adopted several significant mobile source control measures and implemented several significant voluntary programs. Adopted measures include NJLEV, Vehicle Idling, Heavy Duty IM OBD, ACT, Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, Heavy Duty New Engine Standards (Omnibus), Medium Duty Diesel Vehicles (MDDVs) IM and Advanced Clean Cars II. Other states have not adopted some or all of these rules.

Area Source VOC Rules

New Jersey has implemented several area source VOC control measures that are more stringent than Federal standards, many based on stringent California standards. These include rules for consumer products including hairspray, insecticides, household cleaners, air fresheners, automotive brake cleaners, carpet and upholstery cleaners, and household adhesives, paints, stains and varnishes, automotive refinishing, industrial and commercial adhesives, asphalt paving and solvent degreasing.

State of the art (SOTA)

SOTA air pollution control must be implemented for significant equipment at major and minor facilities for new or modified VOC and NO_x sources of air pollution.

Petroleum Storage

New Jersey has implemented one of the most stringent petroleum storage rules in the country, which established requirements to reduce VOC emissions from bulk petroleum storage facilities.

Northern NJ-NY-CT Nonattainment Area

New Jersey does not anticipate attainment of the 2015 70 ppb 8-hour ozone NAAQS for the Northern NJ-NY-CT Nonattainment Area without additional control measure benefits that will be achieved after the 2023 compliance year. However, New Jersey, some of the other states in the nonattainment area and the Federal government have adopted several regulations that will achieve significant benefits post 2023. New Jersey's control measures include new EGU Emission Limits, ACT, Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards, a #4 and #6 Fuel Oil Ban, Heavy Duty IM OBD, Medium Duty Diesel Vehicles (MDDVs) IM, Advanced Clean Cars II and Heavy Duty New Engine Standards (Omnibus). The Federal government has adopted the Good Neighbor Plan for the 2015 Ozone National Ambient Air Quality Standards, Greenhouse Gas Emission Standards for Passenger Cars and Light Trucks, new Heavy-Duty Engine and Vehicle Standards and new rules for Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-duty and Medium-Duty Vehicles and new rules for Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3.

New Jersey has met its RFP demonstration requirements. New Jersey's Northern nonattainment area has achieved an estimated total reduction in VOC and NO_x summer tons per day emissions of 31 percent between 2017 and 2023. This is more than twice the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

Following are additional recommendations to achieve compliance:

- Transport

  While USEPA has made significant strides regarding transport rules, more can and still needs to be done by USEPA, including lower enforceable daily NO_x performance standards for EGUs and distributed generation units, similar to those implemented in New Jersey and other states. And the timeline for implementation of new caps, limits and/or controls should be shortened. The rule does not eliminate significant contribution within the timeframe required by the CAA.

- Rules That Address Power Generation Emissions in New York

  The New York metropolitan area is directly upwind of the controlling Connecticut monitors, with the Long Island Sound waterbody in between. New Jersey has adopted measures to address emissions from EGU sources that operate on high electric demand days when ozone concentrations tend to be elevated that were effective in 2009, 2013, 2014 and 2015, prior to the current attainment dates. On December 31, 2019, New York adopted a rule that addresses NO_x emissions from peaking combustion turbine EGUs with compliance dates of May 1, 2023 (100 ppm limit) and May 1, 2025 (25 ppm limit for gas and 42 ppm limit for oil). On March 11, 2020, New York adopted a regulation, 6 NYCRR Part 222, that establishes performance standards for distributed generation sources with a compliance date of May 1, 2021.

  It is important for upwind states to implement measures to reduce emissions from electric generation on high electric demand days, including electric generating units in CAMD, smaller electric generating units and behind-the-meter demand response units. These rules will assist New York in meeting its good neighbor requirements and assist in achieving attainment of the 70 ppb ozone standard in the Northern NJ-NY-CT Nonattainment Area. However, some of the New York EGU limits are effective after the 2023 compliance ozone season for this attainment demonstration and New Jersey's

stationary generator rule is more stringent than New York's based on applicability thresholds, effective date of emissions limits, and exemptions. New Jersey rules are also implemented statewide while New York's distributed generation rule is limited in scope to the New York Metropolitan area.

- New Jersey RACT Rules in Other States

  Nonattainment area and upwind states should adopt and implement control measures that meet RACT standards like those in New Jersey for sources such as HEDD power generation, DG/DR power generation and municipal waste combustors. In addition, the upwind states should adopt presumptive NO_x emission limits and averaging time requirements like New Jersey and should not allow the buying of allowances to facilitate reduced operation of air pollution controls.

- Mobile Source Rules

  States in the nonattainment areas and upwind states should adopt mobile source measures like those in New Jersey.

Reclassification Request for Northern NJ-NY-CT Nonattainment Area

As discussed in New Jersey's letter to USEPA dated May 23, 2024, pursuant to Clean Air Act section 181(b)(3), and based on monitoring data and modeling data, New Jersey requests a voluntary reclassification of the Northern NJ-NY-CT Nonattainment Area for the 2015 70 ppb 8-hour ozone NAAQS from Moderate to Severe, with a new attainment date of August 3, 2033. If the other states in New Jersey's Northern NJ-NY-CT Nonattainment Area are not agreeable to a voluntary reclassification to Severe, New Jersey requests a voluntary reclassification from Moderate to Serious with a new attainment date of August 3, 2027.

Southern NJ-PA-DE-MD Nonattainment Area

Although 2023 data is preliminary, the Southern NJ-PA-DE-MD Nonattainment Area did not attain the 2015 70 ppb 8-hour ozone NAAQS by the 2023 compliance ozone season. The area experienced significant ozone air quality impacts due to smoke from wildfires in 2023, therefore, the data is not representative of ambient conditions. The states in the nonattainment area are submitting requests to exclude the exceptional events data from 2023. With approval of these exclusions, and a one-year extension of the attainment date to August 3, 2025, New Jersey believes the data shows that the area will attain by this date.

New Jersey has met its RFP demonstration requirements. New Jersey's Southern nonattainment area has achieved an estimated total reduction in VOC and NO_x summer tons per day emissions of 28 percent between 2017 and 2023. This is more than the RFP CAA requirement of a 15 percent reduction over the six-year period for a moderate area.

Chapter 7 CONFORMITY

The Clean Air Act[126] requires that Federal actions conform to a state's State Implementation Plan (SIP). Specifically, the act requires the Federal action/activity will not:

- Cause or contribute to any new violation of any standard in any area;
- Increase the frequency or severity of any existing violation of any standard in any area; or,
- Delay timely attainment of any standard or any required interim emission reductions or any other milestones in any area.

To implement this requirement, the Clean Air Act directed the United States Environmental Protection Agency (USEPA) to issue rules that governed how conformity determinations would be conducted for two categories of actions/activities: a) those dealing with transportation plans, programs and projects (Transportation Conformity), and b) all other actions, e.g., projects requiring Federal permits. This latter category is referred to as General Conformity.

7.1 Transportation Conformity

The Federal Transportation Conformity Rule (40 CFR Sect. 93.100-160) provides the process by which the air quality impact of transportation plans, transportation improvement programs, and projects are analyzed. The agency preparing Transportation Plans (20 or more years), Transportation Improvement Programs (at least four years), or approving a transportation project must analyze the emissions expected from such a proposal in accordance with the Transportation Conformity Rule.[127]

For the purposes of transportation conformity, the motor vehicle emission budget is essentially a cap on the total emissions allocated to onroad vehicles. The projected emissions from a Transportation Plan, Transportation Improvement Program, or project, estimated in accordance with the Transportation Conformity Rule, may not exceed the motor vehicle emissions budget or cap contained in the appropriate SIP. Every significant revision to a Transportation Plan or Transportation Improvement Program must be accompanied by a transportation conformity determination. Transportation conformity determinations must demonstrate, via detailed modeling, that the proposed transportation projects do not increase area emissions above the emissions budgets. Approval of the Transportation Plan or Transportation Improvement Program by the Federal Highway Administration, and thereby the approval of the use of Federal funds, is contingent on the completion of a transportation conformity determination that shows that emissions will remain below the budgets. Emissions in years for which no motor vehicle emissions budgets are specifically established must be less than or equal to the motor vehicle emissions budget established for the most recent prior year.

According to the USEPA's Implementation Rule,[128] 8-hour ozone Transportation Conformity budgets must be established for the RFP emission reduction milestone year of 2023 and the 8-hour ozone attainment year. Although the attainment date for areas classified as moderate for the 70ppb ozone standard is August 3, 2024, the areas must demonstrate attainment by 2023. This section finalizes 8-hour ozone Transportation Conformity emissions budgets for 2023 for the North Jersey Transportation Planning Authority (NJTPA), South Jersey Transportation

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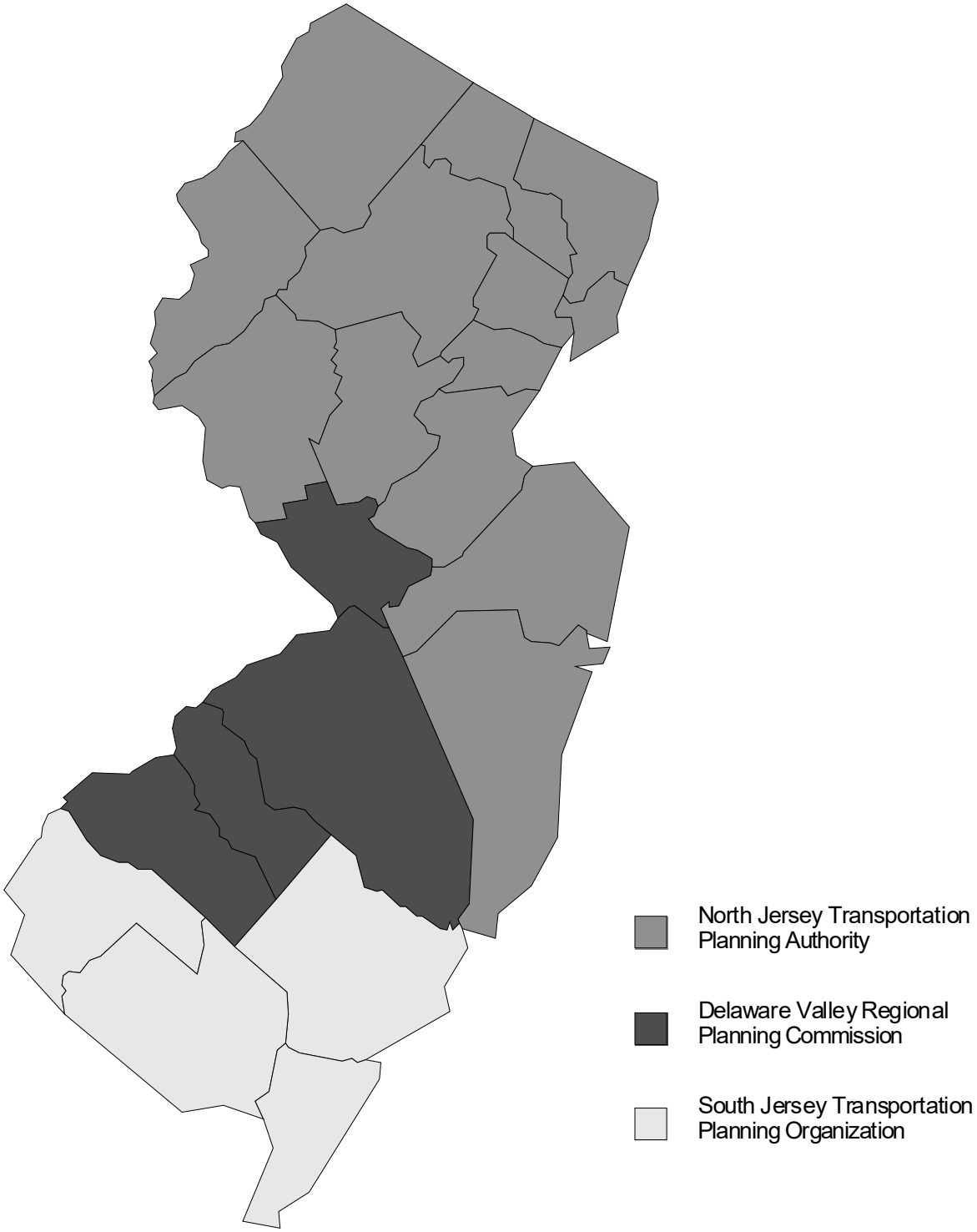
[126] 42 U.S.C. §7506

[127] For New Jersey, such plans are prepared by three Metropolitan Planning Organizations (North Jersey Transportation Planning Authority, South Jersey Transportation Planning Organization and Delaware Valley Regional Planning Commission).

[128] Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements; Final Rule, Federal Register / Vol. 83, No. 234 / Thursday, December 6, 2018.

Planning Organization (SJTPO) and Delaware Valley Regional Planning Commission (DVRPC). As shown in Figure 7-1, New Jersey's 21 counties fall into one of three Metropolitan Planning Organizations (MPOs).

Figure 7-1: Metropolitan Planning Organizations in New Jersey



Each MPO is responsible for the Transportation Plans and Transportation Improvement Programs for its designated area, and each work in consultation with the United States Department of Transportation (USDOT), USEPA, New Jersey Department of Transportation (NJDOT), New Jersey Transit, and New Jersey Department of Environmental Protection (NJDEP) to meet established transportation emissions budgets for their area. The Transportation Conformity budgets are established for each MPO area by nonattainment area. For example, the NJTPA MPO includes the 13 northern-most counties in New Jersey; however, the Northern NJ-NY-CT Nonattainment Area includes only 12 of these counties (Ocean County is part of the Southern NJ-PA-DE-MD Nonattainment Area). The transportation conformity determinations conducted by NJTPA to support its Transportation Plans and Transportation Improvement Programs use both sets of budgets as appropriate. Budgets for a nonattainment area are calculated by adding the onroad emission inventories from individual counties.

New Jersey has two 8-hour ozone nonattainment areas, i.e., the Northern NJ-NY-CT Nonattainment Area and the Southern NJ-PA-DE-MD Nonattainment Area. Both areas are currently classified as moderate for the 2015 70 ppb ozone standard. Areas classified as moderate must demonstrate attainment by August 3, 2024, or the 2023 ozone season.

The 2023 8-hour ozone transportation conformity budgets are presented in Table 7-1 below. Different budgets for the Southern NJ-PA-DE-MD nonattainment area are presented with and without safety margins for contingency measure purposes. The development of the safety margins for contingency measures is discussed in Chapter 9. As described in Chapter 9, if attainment is not achieved by the attainment date, the contingency measure for the Southern NJ-PA-DE-MD Nonattainment Area is to remove the safety margins from the Transportation Conformity budgets. The control measures included in the development of the 2023 Transportation Conformity budgets without safety margins are the same as those included in the 2023 onroad emission inventory development as described in Chapter 3. The approach used to calculate the budgets without safety margins is the same as that used to calculate the 2023 emission inventories as described in Chapter 4 and in Appendix 4-6.

Implementation of the contingency measure would necessitate the USEPA to find the more stringent budgets **without** safety margins adequate for use in Transportation Conformity determinations. The USEPA may choose to implement the contingency measure early and proceed with an action to pursue an adequacy finding for the Transportation Conformity budgets without safety margins prior to the determination of whether or not the area has achieved attainment by the attainment date (especially since it is expected that the Southern NJ-PA-DE-MD nonattainment area will qualify for a one-year extension of the attainment date).

Table 7-1:
8-Hour Ozone Transportation Conformity 2023 Budgets

Transportation Planning Area	2023 Budgets		Contingency Measure Budgets	
	VOC Emissions (tons per summer work weekday)	NO_x Emissions (tons per summer work weekday)	VOC Emissions (tons per summer work weekday)	NO_x Emissions (tons per summer work weekday)
	2023 Budgets With Safety Margins	2023 Budgets With Safety Margins	2023 Budgets Without Safety Margins	2023 Budgets Without Safety Margins
Northern NJ-NY-CT Nonattainment Area				
North Jersey Transportation Planning Authority - 12 Counties (Excluding Ocean County)	30.30	61.83	30.30	61.83
Southern NJ-PA-MD-DE Nonattainment Area				
South Jersey Transportation Planning Organization – 4 Counties	4.27	8.79	3.83	7.84
Delaware Valley Regional Planning Commission – 4 Counties	10.77	18.08	9.65	16.12
North Jersey Transportation Planning Authority - Ocean County	4.06	4.93	3.64	4.40

7.2 General Conformity

The authority to address General Conformity is set forth in Section 176(c) of the Clean Air Act and the requirements to demonstrate conformity are found in the USEPA's implementing regulation (40 CFR Part 93, Subpart B – Determining Conformity of General Federal Actions to State or Federal Implementation Plans). The purpose of General Conformity is to ensure that actions undertaken by Federal agencies will conform to the SIP to attain and maintain the National Ambient Air Quality Standards (NAAQS).

General Conformity applies to criteria pollutants in nonattainment and maintenance areas. Actions that receive federal funding, require a federal permit, license, approval or support but do not fall under Transportation Conformity are subject to General Conformity. The Federal General Conformity regulation (40 CFR 93.161) provides federal installations with the ability to develop a facility-wide budget to demonstrate conformity. New Jersey has established General Conformity budgets for McGuire Air Force Base (AFB) and Lakehurst Naval Air Station (NAS) for VOCs and NO_x and the budgets established for the last, or most recent, year remain constant for future years. For McGuire AFD these General Conformity budgets are 730 tons/year VOC and 1,534 tons/year NO_x. For Lakehurst NAS these General Conformity budgets are 129 tons/year VOC and 793 tons/year NO_x.

Chapter 8 OTHER SIP COMPONENTS

8.1 Infrastructure CAA Section 110

When the USEPA establishes a new or makes a revision to a NAAQS, the CAA Section 110(a)(2) (or 42 U.S.C. § 7410(a)(2)), requires the states to submit to the USEPA a SIP revision or certification indicating that the State has the authority to develop, implement, and enforce an air quality management program that provides for attainment and maintenance of the NAAQS. This SIP revision is referred to as an "Infrastructure" SIP.

Table 8-1 provides a summary of the SIP elements and the citations for New Jersey's authority in the State's statutes, including the Air Pollution Control Act.

Table 8-1:
Infrastructure Elements Required under the CAA Section 110(a)(2)

CAA Element	Summary of Element	New Jersey Authority
110(a)(2)(A)	Enforceable Emission Limitations and Other Control Measures	N.J.S.A. 26:2C-8, 9, 18 and 19 N.J.A.C. 7:27
110(a)(2)(B)	Ambient Air Quality Monitoring, Compilation, Data Analysis, and Reporting	N.J.S.A. 26:2C-9.a.
110(a)(2)(C)	Enforcement and Stationary Source Permitting (PSD)	N.J.S.A. 13:1D-9 N.J.S.A. 26:2C-8 and 19 N.J.S.A. 26:2C-9.b (specifically 9.b(4), 9.b(5) and 9.b(8)) and 9.1 N.J.A.C. 7:27 and 7:27A N.J.A.C. 7:27-8 and 22
110(a)(2)(D)	Interstate Transport of Air Pollution and International Pollution Abatement	N.J.A.C. 7:27 N.J.A.C. 7:27-22.11(k) and 22.24 N.J.S.A. 26:2C-8 and specifically 8.11 N.J.S.A. 26:2C-9 and 9.b(6)
110(a)(2)(E)	Resources, Conflict of Interest, and Emergency Backstop (Funding)	N.J.S.A. 26:2C-3.2 and 8 N.J.S.A. 13:1D-9 N.J.S.A. 52:13D-14 and 16 N.J.S.A. 26:2C-22 N.J.S.A. 26:3A2-21 et seq. N.J.A.C. 7:1H-1 et seq.
110(a)(2)(F)	Stationary Source Emissions Monitoring and Reporting (Emissions Statements)	N.J.S.A. 26:2C-9.b(3) and (4) and 9.2 N.J.A.C. 7:27-8, 11.3(e), 21, and 22.18
110(a)(2)(G)	Emergency Powers and Contingency Plans	N.J.S.A. 26:2C-26 et seq. N.J.A.C. 7:27-12
110(a)(2)(H)	State Implementation Plan Revision for Revised Air Quality Standards or New Attainment Methods	N.J.S.A. 13:1D-9
110(a)(2)(I)	State Implementation Plan for Non-attainment Areas (NNSR)	N.J.S.A. 13:1D-9
110(a)(2)(J)	Consultation, Public Notification, and Prevention of Significant Deterioration (PSD)	N.J.S.A. 26:2C-8, 9, and 19 N.J.S.A. 52:14B-1 et seq. N.J.A.C. 7:27-8.10 and 22.11
110(a)(2)(K)	Air Quality Modeling and Reporting	N.J.S.A. 26:2C-9.2(b) N.J.A.C. 7:27-8.5 and 22.8
110(a)(2)(L)	Major Stationary Source Permitting Fees	N.J.A.C. 7:27-22.31 N.J.S.A. 26:2C-9.b(7), 9.5 and 9.6
110(a)(2)(M)	Consultation with Local Entities	N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.

On May 13, 2019, the NJDEP submitted an Infrastructure SIP revision to USEPA, which addressed the infrastructure and transport requirements of CAA Section 110(a)(2) for the 2015 70 ppb 8-hour ozone NAAQS and the transport requirements only for the 2008 75 ppb 8-hour ozone NAAQS. [129]

On April 12, 2014, USEPA proposed to partially approve and partially disapprove elements of a SIP revision submitted by New Jersey on May 13, 2019, that address the infrastructure SIP requirements for the 2015 8-hour ozone NAAQS. The USEPA proposed to approve most of the elements. USEPA proposed to disapprove the portion of the submission that relates to prevention of significant deterioration (PSD). The disapproval portion of this action does not begin a new Federal Implementation Plan (FIP) clock, because the FIP is already in place.

A summary of the transport related elements is discussed below.

8.1.1 Infrastructure: Transport (or Good Neighbor SIP)

CAA Section 110(a)(2)(D)(i) (or 42 U.S.C. § 7410(a)(2)(D)(i)), requires that each state's SIP contain adequate provisions prohibiting any source, or other type of emissions activity, within the State from emitting any air pollutants in amounts that will:

> "Contribute significantly to nonattainment of the National Ambient Air Quality Standards (NAAQS) for areas in another state or interfere with the maintenance of the NAAQS by another state."

On July 6, 2011, the USEPA finalized the Cross-State Air Pollution Rule (CSAPR) to address air pollution from upwind states that crosses state lines and affects air quality in downwind states. This rule requires certain states in the eastern half of the U.S. to improve air quality by reducing power plant emissions that cross state lines and contribute to ozone and particulate matter pollution in downwind states. The CSAPR replaced USEPA's 2005 Clean Air Interstate Rule (CAIR), following the direction of a 2008 court decision that required USEPA to issue a replacement regulation.

On October 17, 2014, the NJDEP submitted a Multi-Pollutant Infrastructure SIP revision to USEPA, which addressed the requirements of CAA Section 110(a)(2)(D)(i) for the 2008 75 ppb ozone NAAQS.

On January 1, 2015, CSAPR implementation began.

On November 16, 2015, the USEPA proposed an update to its existing Cross-State Air Pollution Rule (CSAPR). The purpose of the CSAPR Update was to "partially" address the requirements of Section 110(a)(2)(D)(i) and the transport of ozone and its precursors from upwind states that significantly contribute to ozone nonattainment or interfere with maintenance of the 2008 75 ppb ozone NAAQS in downwind areas and to act as a Federal Implementation Plan (FIP). The CSAPR Update was a partial remedy for addressing ozone transport and does not provide the necessary reductions for the Northern NJ-NY-CT Nonattainment Area to attain by July 20, 2021.

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[129] The State of New Jersey Department of Environmental Protection State Implementation Plan (SIP) Revision Infrastructure and Transport Requirements Clean Air Act (CAA) Section 110(a)(1) and 110(a)(2) for the 2015 70 ppb 8-hour Ozone National Ambient Air Quality Standard (NAAQS) and Transport Requirements 110(a)(2)(D)(i)(I) for the 2008 75 ppb 8-hour Ozone NAAQS and Negative Declaration for the Oil and Natural Gas Control Techniques Guidelines May 2019.

On March 30, 2016, New Jersey withdrew the CAA Section 110(a)(2)(D)(i)(I) transport portion of its Multi-Pollutant October 17, 2014, Infrastructure SIP revision as it related to the 2008 75 ppb 8-hour ozone NAAQS. This withdrawal was at USEPA's request to facilitate USEPA's progress in implementing the FIP, especially on those upwind states significantly contributing to ozone levels in New Jersey and its shared nonattainment areas. The withdrawal allowed USEPA to include New Jersey in the CSAPR Update FIP.

On June 15, 2016, USEPA published a finding of failure to submit for New Jersey for the interstate transport requirements of CAA Section 110(a)(2)(D)(i)(I) for the 2008 75 ppb 8-hour ozone NAAQS, which was necessary for USEPA to promulgate a FIP to address interstate transport for the 2008 75 ppb 8-hour ozone NAAQS. [130]

On September 7, 2016, the USEPA finalized the CSPAR Update, its "partial" transport remedy for the 2008 75 ppb ozone NAAQS.[131] The 2016 CSAPR Update established lower ozone season NO_x emission budgets for electric generating units (EGUs). The USEPA acknowledged that the 2016 CSAPR Update does not fully address the problem of upwind transport and only provides a partial remedy for the significant contribution of upwind states to downwind nonattainment and maintenance areas for the 2008 75 ppb 8-hour ozone NAAQS.[132]

On January 6, 2017, the USEPA issued a "Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone NAAQS" (NODA) for public comment. The information included emission inventories and modeling results for 2011 and 2023 modeling platform.[133]

On May of 2017 implementation of the 2016 CSAPR Update began.

On October 27, 2017, the USEPA issued a transport guidance memo for the 2008 ozone NAAQS with supplemental updated 2023 modeling based on comments received on the NODA and different technical scenarios.[134]

On March 27, 2018, the USEPA issued a transport guidance memo that provided an update to the January 2017 contribution modeling for the 2015 ozone NAAQS and built upon the information provided in the October 2017 memo.[135]

On July 10, 2018, the USEPA issued a proposed rule, "Determination Regarding Good Neighbor Obligations for the 2008 Ozone National Ambient Air Quality Standard," hereafter referred to as the "USEPA 2018 Good Neighbor Proposal."[136] The rule proposes a determination that, for 20 states for which USEPA has not proposed or taken separate action, the 2016 CSAPR Update fully satisfied the obligations of these states and USEPA under the

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[130] 81 Fed. Reg. 38963 (June 15, 2016).
[131] 81 Fed. Reg. 74504 (October 26, 2016).
[132] USEPA Fact Sheet for the Final Cross-State Air Pollution Rule Update for the 2008 NAAQS, June 2017.
[133] 82 Fed. Reg. 1733, January 6, 2017.
[134] USEPA Memo titled "Supplemental Information on the Interstate Transport State Implementation Plan Submissions for the 2008 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I), October 27, 2017."
[135] "USEPA Information on the Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(1)(I)(I), March 27, 2018," and Supplemental Information Regarding Interstate Transport SIPs for the 2015 Ozone NAAQS, https://www.epa.gov/airmarkets/memo-and-supplemental-information-regarding-interstate-transport-sips-2015-ozone-naaqs
[136] 83 Fed. Reg. 31915 (July 10, 2018).

Good Neighbor provision of the Act for the 2008 ozone NAAQS. USEPA relies on the cost-effectiveness threshold established in the 2016 CSAPR Update and the subsequent USEPA 2023 Transport Modeling. New Jersey does not agree with this proposal, the control measure assumptions, its cost-effectiveness threshold or its use of 2023 modeling for a 2018 attainment date.

On August 31, 2018, in response to stakeholder comments on the March 27, 2018, memo, the USEPA issued a memorandum revising the contribution metric spreadsheet for the 2023 modeling platform originally posted in March 2018 to include the most recent design values (i.e., 2014-2016) and information regarding "home state" and upwind state collective contribution.

On December 21, 2018, the USEPA finalized its 2018 Good Neighbor Proposal [137] which determined that the existing CSAPR Update fully addresses certain states' obligations under the good neighbor provision of the CAA regarding interstate pollution transport for the 2008 ozone NAAQS.

On May 14, 2019, the NJDEP submitted a Transport (Good Neighbor) Infrastructure SIP revision to the USEPA that fully addressed the requirements of CAA Section 110(a)(2)(D)(i)(I), for the 2008 75 ppb and 2015 70 ppb 8-hour ozone NAAQS.

On September 13, 2019, the US Court of Appeals for the DC Circuit remanded the CSAPR Update to the USEPA to address the court's holding that the rule unlawfully allows significant contribution to continue beyond downwind attainment deadlines. The September 13, 2019, decision by the DC Circuit US Court of Appeals found that "…in one respect, the Rule is inconsistent with the Act: it allows upwind States to continue their significant contributions to downwind air quality problems beyond the statutory deadlines by which downwind States must demonstrate their attainment of air quality standards."

On October 1, 2019, the D.C. Circuit vacated the CSAPR Close-Out on the same grounds on which it had remanded without vacatur the CSAPR Update in "Wisconsin, New York v. EPA, 781 Fed. App'x 4, 7 (D.C. Cir. 2019) (New York)." The court found the CSAPR Close-Out inconsistent with the Wisconsin holding because the rule analyzed the year 2023 rather than the next applicable attainment date of 2021 and failed to demonstrate that it was an impossibility to address significant contribution by the 2021 attainment date.[138]

On February 19, 2020, New Jersey was part of a legal action that filed suit on the basis of the USEPA's alleged failure to perform nondiscretionary statutory duties, namely the USEPA's obligation to promulgate FIPs for Upwind States fully addressing those States' Good Neighbor obligations for the 2008 ozone NAAQS by the statutory deadlines.[139]

On March 15, 2021, the UESPA finalized the Revised CSAPR Update for the 2008 75 ppb ozone NAAQS.[140]

On February 28, 2022, the USEPA issued a proposed Good Neighbor Plan for the 2015 70 ppb ozone NAAQS.

On September 12, 2022, USEPA published "Air Plan Disapproval; New York and New Jersey; Interstate Transport Infrastructure SIP Requirements for the 2008 Ozone NAAQS" and on February 13, 2023, USEPA published "Final Disapproval of 2015 Good Neighbor SIP

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[137] 83 Fed. Reg. 65878 (December 21, 2018)
[138] 85 Fed. Reg. 68966
[139] Civil Action No. 20-cv-1425, filed February 19, 2020
[140] 86 Fed. Reg. 23054 (April 30, 2021)

Submissions" in order to move forward with its Good Neighbor Federal Implementation Plans (FIPs.)

On June 5, 2023, the USEPA published its final Good Neighbor Plan entitled "Federal 'Good Neighbor Plan' for the 2015 Ozone National Ambient Air Quality Standards" effective August 4, 2023, which secures reductions in ozone-forming emissions of NO_x from power plants and industrial facilities.[141] As of November 30, 2023, the Good Neighbor Plan's "Group 3" ozone-season NO_x control program for power plants is being implemented in the following states, all of which already were covered by the various USEPA's Cross-State Air Pollution Rules ozone season NO_x trading programs: Illinois, Indiana, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, and Wisconsin. Pursuant to court orders staying the Agency's SIP Disapproval action as to the following states, the USEPA is not currently implementing the Good Neighbor Plan "Group 3" ozone-season NO_x control program for power plants in the following states: Alabama, Arkansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nevada, Oklahoma, Texas, Utah, and West Virginia.[142]

The USEPA CSAPR, CSAPR Update and Revised CSAPR Update were not stringent enough to achieve the necessary reductions from significant sources of transported pollution and were also not implemented in a timely manner to provide ozone reductions in downwind states ahead of the 2008 75 ppb ozone standards attainment deadlines for the Marginal, Moderate and Serious classifications. USEPA's Good Neighbor Plan for the 2015 Ozone National Ambient Air Quality Standards (2015 Transport Rule) is significantly better than the CSAPR regulations. USEPA's final 2015 Good Neighbor Plan contains provisions for the backstop daily NO_x emissions rate for individual units and requires optimized use of existing emissions controls to reduce NO_x emissions from power plants in 2023 followed by steeper NO_x cuts in 2026. The final rule has declining NO_x budgets and allowance-based ozone season trading. The rule includes a provision to recalibrate the size of the emissions allowance bank on an annual basis to incentivize emissions reductions by operating existing control devices and discourage the practice of purchasing allowances to cover excess emissions on high energy demand days. Budgets are adjusted based on facility specific operations from previous years. The final rule requires unit specific optimization by ozone season. The 2015 Transport Rule includes industrial (non-EGU) control measures, some of which were modeled after New Jersey's RACT rules. However, while USEPA has made significant strides regarding transport rules, more can still be done by USEPA like lower enforceable daily NO_x performance standards for EGUs and distributed generation units, similar to those implemented in New Jersey and other states. And the timeline for implementation of new controls should be shortened. The rule does not eliminate significant contribution within the timeframe required by the CAA.

On January 16, 2024, the USEPA proposed a supplemental Good Neighbor Action to include additional states (Arizona, Iowa, Kansas, New Mexico, and Tennessee) in the Good Neighbor Federal Implementation Plan (FIP.)[143]

8.1.2 Infrastructure: Visibility

On September 19, 2016,[144] USEPA approved the portion of the October 17, 2014, SIP submittal from New Jersey pertaining to the requirements of CAA Section 110(a)(2)(D)(i)(II) prong 4 requirement for visibility (or prong 4) for the 2008 Lead, 2008 Ozone, 2010 NO_2, 2010 SO_2, and 2012 PM2.5, 2006 PM10 and 2011 CO NAAQS.

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[141] 88 Fed. Reg. 36654 (June 5, 2023)
[142] https://www.epa.gov/Cross-State-Air-Pollution/epa-response-judicial-stay-orders
[143] 89 Fed. Reg. 12666 (February 16, 2024).
[144] 81 Fed. Reg. 64070 (September 19, 2016).

8.1.3 Infrastructure: Prevention of Significant Deterioration (PSD) Permitting

The Clean Air Act requires a state to implement a prevention of significant deterioration (PSD) permitting program at Section 110(a)(2)(D)(i)(II) prong 3. New Jersey's PSD permitting program applies when a major source that is located in an area designated as attainment or unclassifiable for any criteria pollutant, is constructed, or undergoes a major modification. New Jersey has elected to comply with the Federal PSD requirements by accepting delegation of the Federal rules and has been successfully implementing this program for many years. New Jersey accepted delegation of the administration of the Federal PSD program from the USEPA on February 22, 1983, and the provisions of 40 CFR 52.21(b) through (w), related to Prevention of Significant Deterioration, were incorporated into New Jersey's SIP at 40 CFR 52.1603(b). New Jersey's delegation was most recently revised on July 11, 2011.

However, USEPA does not recognize a delegated PSD program as satisfying the Infrastructure SIP requirements. Therefore, on September 19, 2016, [145] USEPA disapproved New Jersey's submittal pertaining to the requirements of CAA Section 110(a)(2)(D)(i)(II) requirement for PSD (or prong 3) for the 2008 Lead, 2008 Ozone, 2010 NO_2, 2010 SO_2, and 2012 PM2.5, 2006 p.m.10 and 2011 CO NAAQS. USEPA noted in its disapproval that New Jersey is complying with the Federal PSD requirements by accepting delegation of the Federal rules and has been successfully implementing this program for many years. The disapproval will not trigger any sanctions or additional Federal Implementation Plan obligation because a PSD Federal Implementation Plan is in place. New Jersey's regulations at N.J.A.C. 7:27-8.5 (Air quality impact analysis), 18 (Emission Offset Rule), and 22.8 (Air quality simulation modeling and risk assessment) meet the Federal requirements for preventing a violation of the NAAQS in areas already attaining the NAAQS. Also note, the entire state of New Jersey is in nonattainment for ozone, therefore, nonattainment new source review (NNSR) applies in New Jersey for ozone, not PSD.

8.1.4 Infrastructure: Nonattainment New Source Review (NNSR) Permitting

USEPA no longer takes action on the NNSR element as part of a State's infrastructure SIP at 110(a)(2)I and instead address's NNSR as part of a State's attainment demonstration. USEPA's September 2013 guidance[146] stated that the NNSR elements were not to be addressed in infrastructure SIP submissions and were to be addressed through a separate process. NNSR is addressed below.

8.2 New Source Review/Permitting

8.2.1 Introduction and Background

The CAA Section 110(a)(2)(C) requires that States include a permitting program in their SIP to ensure that the construction or modification of a stationary source of air pollution does not interfere with the attainment or maintenance of a NAAQS or violate the control strategy in a nonattainment area. The Federal New Source Review (NSR) program is a pre-construction permitting program designed to meet these requirements. The Federal NSR program has three components: nonattainment NSR (NNSR); prevention of significant deterioration (PSD); and minor NSR.

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[145] 81 Fed. Reg. 64070 (September 19, 2016).

The NNSR program applies when a new major stationary source is constructed in a nonattainment area, or if the proposed or actual emissions from a modified existing source exceed the applicable thresholds at 40 CFR 51.165 and 40 CFR Part 51, Emission Offset Interpretative Ruling (Appendix S). NNSR can also apply to a major source or major modification that is proposed in an attainment or unclassifiable area, if it would significantly affect a nonattainment area or cause a violation of the NAAQS in an attainment area. To obtain a permit that complies with the Federal requirements, an applicant must show that the lowest achievable emission rate (LAER) control technology will be installed; certify that all major sources owned or operated by the applicant in the state are in compliance with all applicable State rules and Federal regulations; conduct an alternative siting analysis, which demonstrates that the benefits of the proposed construction or modification outweigh its environmental and social costs; and secure creditable emission reductions to offset increased emissions. New Jersey's NNSR program, codified in N.J.A.C. 7:27-18, is described in Section 8.2.2 below.

The PSD program applies to new and modified major sources in an attainment or unclassifiable area. A new or modified source that is subject to the PSD requirements must obtain a pre-construction permit and demonstrate compliance with the PSD program requirements at 40 CFR Part 52.21. The PSD program is administered by USEPA, a state to which USEPA has delegated permit review authority, or a state that has incorporated the Federal PSD program regulation into its SIP. New Jersey has delegated permit review authority pursuant to the April 19, 1983, delegation agreement between USEPA and New Jersey (48 FR 16738) as revised on July 15, 2011. Therefore, the Department includes the Federal PSD program requirements in its air pollution control permits, and reviews permit applications to ensure that the permits reflect compliance with the PSD program requirements. The PSD requirements are reflected in N.J.A.C. 7:27-8 and N.J.A.C. 7:27-22.

The minor NSR program applies to the construction or modification of minor sources, whether the area in which the source is located is designated in attainment or nonattainment. The Federal minor NSR program rules at 40 CFR Part 51, Subpart I, do not establish specific standards or requirements for the regulated entities; these are left to the states to formulate. A state can customize the requirements of the minor NSR program if its program meets minimum requirements. New Jersey's minor NSR program at N.J.A.C. 7:27-8 is part of the SIP's control strategy to achieve and maintain the NAAQS for ozone and other criteria pollutants.

8.2.2 New Jersey's NNSR Program

New Jersey is required to implement a permitting program that conforms with Section 172(c)(5) and Section 173 of the CAA related to requirements for ozone nonattainment areas. New Jersey counties were designated as nonattainment for the 1-hour ozone NAAQS and classified as severe. New Jersey implemented an NNSR permitting program statewide for addressing the ozone precursors (VOC and NO_x) in accordance with the requirements of its 1-hour ozone severe classification with an applicability threshold of 25 tons per year (tpy) of VOC and NO_x, respectively, for the entire State in 1992. New Jersey continued to be nonattainment for the 1997, 2008 and 2015 8-hour ozone standards at lower classifications and required applicability threshold than for the 1-hour ozone standards. The CAA allows an applicability threshold of 100 tpy for facilities located in a moderate nonattainment area and 50 tpy for facilities located in a serious nonattainment area.

New Jersey's NNSR program remains in effect statewide with a major source applicability threshold of 25 tpy of VOC and NO_x, respectively. This is consistent with the classification of severe and is more stringent than what is required for New Jersey's current statewide classification of moderate for the 2015 70 ppb 8-hour ozone NAAQS, in accordance with requirements for anti-backsliding provisions at CAA Section 172(e).

New Jersey codified the federal NNSR requirements for ozone and other criteria pollutants (including PM2.5 and its precursors) at N.J.A.C. 7:27-18, the Emission Offset rules, which are part of its SIP. New Jersey's proposal to address the Federal requirements for PM2.5 emissions in the Emission Offset rules was proposed in the March 20, 2017, New Jersey Register and finalized in the November 6, 2017, New Jersey Register (49 N.J.R. 3511.) New Jersey submitted the rule adoption as a New Jersey SIP revision to USEPA for review and approval on November 30, 2017. USEPA approved the New Jersey submittals on November 28, 2023.[147]

8.2.3 NNSR Program Compliance Certification

On December 22, 2017, New Jersey submitted a NNSR Program Compliance Certification for the 2008 75 ppb ozone NAAQS. [148] At the time New Jersey's Northern NJ-NY-CT Nonattainment Area was classified as moderate for the 2008 NAAQS and New Jersey's Southern NJ-PA-DE-MD Nonattainment Area was classified as marginal and in compliance with the standard. New Jersey's nonattainment areas were not classified for the 2015 70 ppb ozone NAAQS until June 4, 2018. New Jersey demonstrated that the provisions of N.J.A.C. 7:27-18 are at least as stringent as the Federal requirements at 40 CFR 51.165 for ozone and its precursors for the current classifications.

On October 9, 2018, USEPA fully approved New Jersey's "2008 8-hour Ozone Specific Non-attainment New Source Review Requirements, Statewide." [149]

On November 18, 2021, New Jersey again submitted its NNSR Program Compliance Certification [150], certifying that its NNSR program satisfies the requirements for implementing the 2008 75 ppb ozone NAAQS for a serious classification for the New Jersey portion of the Northern NJ-NY-CT Nonattainment area and for the 2015 70 ppb ozone NAAQS statewide for the New Jersey portions of the Northern NJ-NY-CT and Southern NJ-PA-DE-MD Nonattainment Areas. At the time of the final SIP, New Jersey's northern nonattainment area was classified as moderate, and New Jersey's southern nonattainment area was classified as marginal.

On October 7, 2022, USEPA reclassified the Southern NJ-PA-DE-MD Nonattainment Area from marginal to moderate.

New Jersey is again certifying that its existing USEPA-approved NNSR rules codified at N.J.A.C. 7:27-18 are at least as stringent as the Federal requirements at 40 CFR 51.165 for ozone and its precursors for the New Jersey portions of the Northern NJ-NY-CT and Southern NJ-PA-DE-MD Nonattainment Areas current classification of moderate for the 2015 70 ppb 8-hour ozone NAAQS. A compliance demonstration of New Jersey NNSR rules with the Federal provisions, that was submitted and approved previously as discussed above is provided again below in Table 8-2.

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[147] 88 Fed. Reg. 83036 (November 28, 2023).
[148] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards,1997 84 ppb and 2008 75 ppb 8-Hour Ozone Attainment Demonstration Northern New Jersey-New York-Connecticut Nonattainment Area and Nonattainment New Source Review (NNSR) Program Compliance Certification New Jersey Statewide, December 22, 2017.
[149] 83 Fed. Reg. 50506 (October 9, 2019).
[150] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, 2008 75 ppb 8-Hour Ozone Attainment Demonstration, Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT) Determinations and Nonattainment New Source Review (NNSR) Program Compliance Certifications, and 2017 Periodic Emissions Inventory, November 18, 2021.

Table 8-2:
New Jersey Nonattainment New Source Review (NNSR) Rules
Compliance Demonstration with Federal Provisions

	70 ppb Ozone NNSR SIP Requirements	Federal Provisions	New Jersey Provisions*
1	Major source thresholds for ozone – VOC and NO_x	40 CFR 51.165(a)(1)(iv)(A)(1)(i)-(iv) and (2)	N.J.A.C. 7:27-18.2(a)1 and 2
2	Change constitutes a major source by itself	40 CFR 51.165(a)(1)(iv)(A)(*3*)	N.J.A.C. 7:27-18.2(a)2
3	Significant net emissions increase of NO_x is significant for ozone	40 CFR 51.165(a)(1)(v)(E)	N.J.A.C. 7:27-18.7(a)1 and 2; and the definition of "Respective criteria pollutant" at N.J.A.C. 7:27-18.1
4	Any emissions change of VOC in Extreme area triggers NNSR	40 CFR 51.165(a)(1)(v)(F)	Not Applicable. New Jersey does not have, nor has ever had, "extreme" areas
5	Significant emissions rates for VOC and NO_x as ozone precursors	40 CFR 51.165(a)(1)(x)(A)-(C) and (E)	N.J.A.C. 7:27-18.7, Table 3
6	Provisions for emissions reduction credits	40 CFR 51.165(a)(3)(ii)(C)(*1*)-(*2*)	N.J.A.C. 7:27-18.5(a) and (b) N.J. A.C. 7:27-18.1 N.J.A.C. 7:27-18.8(f)
7	Requirements for VOC apply to NO_x as ozone precursors	40 CFR 51.165(a)(*8*)	N.J.A.C. 7:27-18.2(a)1 and 2; N.J.A.C. 7:27-18.7, Table 3, and the definition of "Respective criteria pollutant" at N.J.A.C. 7:27-18.1
8	Offset ratios for VOC and NO_x for ozone nonattainment areas	40 CFR 51.165(a)(*9*)(i)-(iii)	N.J.A.C. 7:27-18.5(c), Table 2
9	Anti-backsliding provision(s), where applicable	40 CFR 51.165(a)(*12*)	Statewide NNSR thresholds and offset ratios were adopted in1992 based on New Jersey's most stringent classification of severe nonattainment for the 1-hour ozone NAAQS. These thresholds and offset ratios have not been amended to be less stringent since adoption. The entire State continues to be in nonattainment for the 75 ppb and 70 ppb 8-hour ozone NAAQS, therefore, the existing ozone NNSR program remains in effect with no amendments that affect stringency.

* A copy of N.J.A.C. 7:27-18 is available https://dep.nj.gov/wp-content/uploads/aqm/sub18.pdf.

Chapter 9 CONTINGENCY MEASURES

9.1 Introduction

Contingency measure (CM) requirements are specified in CAA Section 172(c)(9) for nonattainment areas generally, and in Section 182(c)(9) for Serious or higher ozone nonattainment areas. The USEPA Ozone Implementation Rule for the 2015 70 ppb 8-hour ozone standard[151] requires that the SIPs for all 8-hour ozone nonattainment areas include CMs. CMs are additional control requirements needed to further reduce emissions in the event an area fails to meet a reasonable further progress (RFP) milestone or fails to attain by its attainment date. Contingency measure requirements have been significantly changed in recent years by a series of court decisions. A detailed summary of the recent court decisions and the resulting new CM requirements have been documented by the USEPA in the following: "DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, March 16, 2023" (USEPA 2023 Draft CM Guidance). In order to address the court decisions, the USEPA 2023 Draft CM Guidance prohibits an approach that many air agencies have historically used to meet the CM requirement, i.e., the reliance on control measures adopted prior to the attainment date that continue to obtain new emission reductions after the attainment date. The commonly used approach has been to rely on new reductions from mobile source fleet and equipment turnover from already-adopted federal or state control measures for new engine standards.

The USEPA 2023 Draft CM Guidance focuses on the following three key components of the new CM requirements:

1. First, the guidance addresses the method that air agencies should use to calculate the USEPA-recommended amount of emission reductions that CMs should provide. Long-standing USEPA guidance has recommended that CMs provide a combination of VOC and NO_x reductions that are equal to or greater than three percent of the VOC base year inventory. In the new guidance the USEPA now believes that its previous one year's worth of RFP approach to calculating the amount of reductions for CMs was unnecessarily conservative for estimating the amount of emissions reductions needed for CM purposes. The new approach requires an average annual emission reduction between the base year and the attainment year divided by the base year emissions and multiplied by the attainment year emissions. This calculation is performed separately for both the VOC inventory and the NO_x inventory to arrive at the new total amount of emissions reductions required for CM purposes.

   For this attainment demonstration SIP, as shown later in this chapter, the new CM calculations result in emissions reductions for CM purposes that are much greater, i.e., more conservative, than if the previous methodology was retained. In addition, the USEPA notes that this new calculation depends on an approvable attainment demonstration, which could either be a modeled attainment demonstration or, where the model does not show attainment, one that relies on weight of evidence to demonstrate attainment. For the two New Jersey 2015 70ppb standard moderate nonattainment areas, only the Southern NJ-PA-MD-DE nonattainment area meets this requirement. Therefore, it is possible to proceed with the quantification of the emission reduction requirements for CMs for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area only.

[151] 83 Fed. Reg. 62998 (December 6, 2018)

2. Second, the guidance addresses the situation where an air agency cannot identify feasible CMs in sufficient quantity to produce the recommended amount of reductions using the updated metric. Previous USEPA policy has indicated that states could provide a "reasoned justification" to have CMs that result in less than the recommended one year's worth (OYW) of RFP. The new guidance provides air agencies with specific recommendations about how to develop such reasoned justifications to support SIP submissions for which the submitting agency is asserting that it cannot provide for the recommended amount of CM reductions due to a lack of feasible measures. The USEPA anticipates that, except in extremely rare instances, a state will be able to identify at least some feasible measures to serve as CMs, even if they achieve substantially less than OYW of progress. The USEPA does not recommend submission of a plan that provides no CMs (i.e., zero reductions) for a given precursor.

3. Finally, this guidance addresses the time period within which reductions from CMs should occur. The USEPA previously recommended that CMs take effect within 60 days of being triggered, and that the resulting reductions generally occur within one year of the CMs being triggered. In instances where there are insufficient CMs available to achieve the recommended amount of emissions reductions within one year, the USEPA provides recommendations for how air agencies could include CMs that provide reductions within up to two years of being triggered. The guidance does not alter the 60-day recommendation for the measures to take effect.

An important aspect of the new CM methodology is that the attainment inventory used for the calculation of the OYW of emission reductions must be from an approvable attainment demonstration. As stated in the guidance: "…if EPA is unable to approve the attainment demonstration for reasons related to the adequacy of the modeling or weight of evidence demonstration, then EPA would not be able to approve as adequate the amount of CMs the air agency provided." Since attainment cannot be demonstrated for the Northern NJ-NY-CT nonattainment area, CMs cannot be developed for that area. The remainder of this section will address the CM requirements for the Southern NJ-PA-MD-DE nonattainment area only.

Contingency measures are required for each milestone year. As discussed in Chapter 4 – Emission Inventories, the future projection year for the attainment demonstration is 2023. Therefore, the 70 ppb 8-hour ozone attainment milestone is defined as 2023. For RFP the milestone year is also 2023.

On August 23, 1993, the USEPA issued a guidance memorandum concerning, among other issues, the CM requirement. In this 1993 guidance, the USEPA indicated that for states with ozone nonattainment areas classified Moderate and higher that had completed the initial 15 percent VOC reductions for RFP, CMs could be a mixture of VOC and NO_x reductions on a percentage basis. The USEPA indicated that of the OYW of reductions required, at least 10 percent should be VOC emissions reductions, allowing up to 90 percent of the CM emissions reductions to be NO_x emissions reductions.[152] The 2023 guidance (and 2015 ozone implementation rule) states that Moderate and above areas that have completed the initial 15 percent VOC reduction required by CAA Section 182(b)(1)(A)(i) can meet the contingency measures requirement based entirely on NO_X controls if that is what the state's analyses have demonstrated would be more effective in bringing the area into attainment. There would be no minimum VOC requirement.

[152] USEPA Memorandum from Michael H. Shapiro to Region Air Directors, "Guidance on Issues Related to 15% Rate-of-Progress Plans," August 23, 1993.

9.2 Identification and Justification of the Contingency Measures

New Jersey must identify contingency measures to be implemented in the event that the state does not attain the 2015 70 ppb 8-hour ozone standard by August 3, 2024, as determined by the 2023 ozone season design values. Both the RFP and attainment contingency requirement for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area will be met with a combination of VOC and NO_x emission reductions by removing the safety margins from the transportation conformity motor vehicle emission budgets (MVEBs). MVEBs are established to provide a limit on the amount of onroad emissions that are allowed to be generated after considering the transportation project plans developed by the three Metropolitan Planning Organizations (MPOs) in New Jersey. Removal of the safety margins results in the MVEBs becoming more stringent, such that transportation projects are further constrained in the amount of emissions that they are allowed to generate. MVEBs act as constraints on emissions for the budget year and all subsequent years analyzed during the periodic transportation conformity determinations. The MVEBs presented in this SIP (in both this chapter and Chapter 7 - Conformity) are established with safety margins.

Safety margins are defined in the transportation conformity regulations at 40 CFR Part 93 Subpart A as the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance. In accordance with the transportation conformity regulations, where the estimate of emissions from all sources is less than required to demonstrate the RFP milestone, attainment, or maintenance, the SIP may explicitly quantify the safety margin and include some, or all, of it in the MVEBs for purposes of conformity.

As demonstrated in Chapter 5 - RFP, for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area, the percent reduction of VOC and NO_x from the 2017 baseline to the 2023 attainment year inventory (with portions of the safety margins incorporated in the MVEBs as the onroad inventory) is 28% percent, which significantly exceeds the RFP-required 15 percent. Regarding attainment, based on the preliminary actual 2023 monitored ozone levels, the NJDEP believes that, after taking Exceptional Events from wildfires into account, the fourth highest 8-hour values for 2023 will meet the 70ppb standard, which will allow the area to qualify for a one-year extension of the attainment date from August 3, 2024, to August 3, 2025. The extension of the attainment date by one year would generate additional emission reductions of approximately 2 tpd of VOC and 4 tpd of NO_x. These reductions were estimated by assuming they are equal to 1/6 of the emission reductions estimated from 2017 to 2023 as follows:

> Based on the emission inventory values presented in Chapter 5 – RFP (prior to the addition of safety margins):
>
> > VOC: 148.10 tpd in 2017 to 135.02 tpd in 2023. The calculation is:
> > (148.10-135.02)/6 = 2 tpd reductions per year.
> >
> > NO_x: 115.00 tpd in 2017 to 88.03 tpd in 2023. The calculation is:
> > (115.00-88.03)/6 = 4 tpd reductions per year.

Therefore, a total of about 6 tpd of VOC+NO_x is available for allocation to safety margins without compromising the demonstration of attainment.

Also, since the earliest that the transportation conformity budgets would be found adequate by the USEPA and could start being used for conformity demonstrations would be in 2024, the availability of these additional emission reductions beyond those needed for attainment can be considered to be a safety margin for the 2023 attainment inventory. A portion of these safety margins equal to OYW of reductions to satisfy CM requirements added to the 2023 MVEBs is

appropriate. Therefore, the addition of a portion of available safety margins in the establishment of transportation conformity MVEBs does not interfere with the achievement of RFP or the demonstration of attainment.

Also, all of the monitors in the New Jersey portion of the Southern NJ-PA-DE-MD Nonattainment Area are in compliance with 70 ppb standard for the 2022 and 2023 ozone seasons, even with the exceptional event data from the significant wildfires included. The controlling Pennsylvania Bucks monitor is slightly over the standard at 72 ppb in 2022 and 73 ppb in 2023. As discussed in Chapter 2, the area experienced significant impacts from wildfire smoke in 2023, therefore, the 2023 data is not representative of ambient conditions. This also demonstrates that the addition of a portion of available safety margins in the establishment of transportation conformity MVEBs will not interfere with the achievement of attainment.

In addition, lowering of the transportation conformity budgets meets all of the new requirements for CMs listed in the USEPA 2023 CM Guidance as demonstrated in the following table:

Documentation That the Proposed New Jersey CMs Meets All of the Current Requirements for CMs

CM Requirement from USEPA 2023 Draft CM Guidance	How the Removal of the MVEB Safety Margins in the MVEBs Meets the New CM Requirements
CMs must be conditional and prospective, not already implemented.	Removal of MVEB safety margins is a new control requirement that would only be implemented if CM emission benefits are required.
CMs cannot be control measures that states are required to adopt and implement to meet other legal requirements.	States are not required to reduce MVEB safety margins to meet other legal requirements.
CMs should achieve emissions reductions equal to or greater than OYW of emissions reductions required for CM purposes as calculated using the methodology specified in the USEPA 2023 Draft Guidance.	The MVEB safety margins are equal to the OYW of emission reductions required for CM purposes calculated using methodology specified in the USEPA 2023 Draft Guidance.
CMs should take effect within 60 days, and with no further significant action by the state or the USEPA, following the USEPA notification to the state of a failure to meet RFP or a failure to attain.	Removal of MVEB safety margins would take effect without further action by the Department. The USEPA would be able to immediately complete the process of finding the new transportation conformity budgets adequate and transportation projects would then be constrained by the lower budgets.
The emissions reductions from the CMs should generally occur in the year following the determination of failure to meet RFP or failure to attain.	The increased constraints imposed on emissions generated by transportation projects due to the more stringent MVEBs would occur in the year following the triggering of CMs.
CMs may be measures that apply to sources outside the designated NAA with an adequate technical demonstration showing that the emissions reductions from the CMs would provide the necessary air quality benefit within the NAA.	All emission reductions from the proposed CMs would occur within the NAA.
States may or may not designate that certain CMs are for RFP failure only or for failure to attain only.	The proposed CMs are for both RFP failure and/or failure to attain.

9.3 Calculation of the OYW of Emission Reductions for CMs

In this section the OYW of emission reductions required by CMs are calculated in accordance with the USEPA Draft 2023 CM Guidance for the Southern NJ-PA-MD-DE nonattainment area.

In the guidance, the USEPA recommends that air agencies use the following equation to calculate OYW of progress for the purpose of assessing the adequacy of the reductions provided by the submitted CMs:

$$\frac{(base\ year\ EI\ -\ attainment\ year\ EI)}{(attainment\ year\ -\ base\ year)} \times \frac{(attainment\ year\ EI)}{(base\ year\ EI)} = OYW\ of\ Progress$$

The following variables (developed in Chapter 5 – RFP) applicable to the above equation are presented below:

- *base year EI* = 148.10 tpd VOC and 115.00 tpd NO_x
- *attainment year EI* = 135.02* tpd VOC and 88.03* tpd NO_x

  * Note that for purposes of these calculations the attainment year emission inventories do not contain safety margin emissions so that the OYW of progress emission calculations are conservative.

- *(attainment year – base year)* = (2023-2017) = 6 years

The calculation methodology as specified in the USEPA Draft 2023 CM Guidance consists of the following three steps:

Step 1: Calculate the average annual emissions reductions needed to attain. For each relevant precursor, determine the amount of emissions reductions between the base year and the projected attainment year and divide by the number of years between the base year and the attainment year.

Step 2: Calculate the annual percentage reduction needed to attain. This is obtained by dividing the annual average reductions by the base year inventory for the NAA.

Step 3: Calculate the amount of emissions reductions needed for OYW of progress. Multiply the annual percentage reduction needed to attain (from Step 2) by the total emissions from the *a*ttainment projected inventory for the NAA.

Following are the calculations applied to the Southern NJ-PA-MD-DE nonattainment area:

$OYW\ of\ Progress\ for\ VOC$:

$$\frac{(148.10\ tpd - 135.02\ tpd)}{(2023 - 2017)} \times \frac{(135.02\ tpd)}{(148.10\ tpd)} = 1.99\ tpd$$

$OYW\ of\ Progress\ for\ NO_x$:

$$\frac{(115.00\ tpd - 88.03\ tpd)}{(2023 - 2017)} \times \frac{(88.03\ tpd)}{(115.00\ tpd)} = 3.44\ tpd$$

Following are the same calculations presented in a stepwise format consistent with the example provided in the USEPA Draft 2023 CM Guidance:

Step 1: Calculate the annual average reductions needed to attain for each relevant precursor.

VOC – Step 1a	148.10 tpd – 135.02 tpd = 13.08 tpd
VOC – Step 1b	13.08 tpd / 6 years = 2.18 tpd
NO_x – Step 1a	115.00 tpd – 88.03 tpd = 26.97 tpd
NO_x – Step 1b	26.97 tpd / 6 years = 4.49 tpd

Step 2: Calculate the annual percentage reduction needed to attain.

VOC	2.18 tpd / 148.10 tpd = 0.0147 (or 1.47%)
NO_x	4.49 tpd / 115.00 tpd = 0.0391 (or 3.91%)

Step 3: Calculate the amount of reductions needed for OYW of progress.

VOC	135.02 tpd X 0.0147 (or 1.47%) = 1.99 tpd*
NO_x	88.03 tpd X 0.0391 (or 3.91%) = 3.44 tpd*

* Note that the new methodology to calculate OYW of progress for CMs results in much greater levels of required emission reductions (VOC/NO_x reductions of 1.99 + 3.44 = 5.43 tpd) than the previous long-standing requirement that CMs reduce a combination of VOCs and NO_x equal to 3% of the VOC base year emission inventory (3% of 148.10 = 4.44 tpd).

9.4 Allocation of OYW of Progress to MVEBs and Summary of CMs

As calculated in the previous section, the OYW of progress emission reductions required to be achieved for the New Jersey portion of the Southern NJ-PA-MD-DE nonattainment area (SNAA) is 1.99 tpd of VOC and 3.44 tpd of NO_x. The 2023 guidance allows substitution of VOC for NO_x, or vice versa, however, New Jersey does not need to use substitution to satisfy the requirements. New Jersey proposes to allocate these amounts as safety margins to the various 2023 transportation conformity budgets. As previously explained, if CMs are subsequently triggered, the safety margins would be immediately removed, thereby increasing the stringency of the MVEBs such that transportation projects are further constrained in the amount of emissions that they are allowed to generate. As shown in the following table, New Jersey has decided to allocate the total NAA safety margins required for OYW of progress among the various MPO MVEBs (transportation planning areas) in proportion to the relative magnitudes of the individual budgets prior to the addition of the safety margins. The following table contains the MVEBs without safety measures (in bold type and shaded) in section one, followed by the safety margins to be allocated to each MVEB in section two, and finally the MVEBs with safety margins (in bold type) are provided in section three.

Allocation of One Year's Worth of Progress for Contingency Measure Purposes to Transportation Conformity Motor Vehicle Emission Budget Safety Margins Southern NJ-PA-MD-DE NAA

Transportation Planning Area Southern NJ-PA-MD-DE NAA	Transportation Motor Vehicle Conformity Budgets (MVEBs)	
	VOC Emissions (tons per summer work weekday)	NO_x Emissions (tons per summer work weekday)
	2023	**2023**
1. Contingency Measures: MVEBs Without Safety Margins		
South Jersey Transportation Planning Organization (SJTPO) (4 Counties)	**3.83**	**7.84**
Delaware Valley Regional Planning Commission (DVRPC) (4 Counties)	**9.65**	**16.12**
North Jersey Transportation Planning Authority (NJTPA) (Ocean County)	**3.64**	**4.4**
SNAA Totals (Without Safety Margins)	17.12	28.36
2. Safety Margins Allocated to NAA MVEBs*		
South Jersey Transportation Planning Organization (4 Counties)	0.44	0.95
Delaware Valley Regional Planning Commission (4 Counties)	1.12	1.96
North Jersey Transportation Planning Authority (Ocean County)	0.42	0.53
Total Allocated Safety Margins (OYW of Progress for CMs)	1.99	3.44
3. MVEBs With Safety Margins		
South Jersey Transportation Planning Organization (4 Counties)	**4.27**	**8.79**
Delaware Valley Regional Planning Commission (4 Counties)	**10.77**	**18.08**
North Jersey Transportation Planning Authority (NJTPA) (Ocean County)	**4.06**	**4.93**
SNAA Totals with Safety Margins	19.11	31.80

* Safety margins are allocated to the various MPO MVEBs (transportation planning areas) in proportion to the relative magnitudes of the individual budgets prior to the addition of the safety margins. For example, 0.60 tpd is allocated to the safety margin for the SJTPO VOC MVEB by multiplying the total VOC SNAA safety margin (1.99 tpd) by the SJTPO MVEB without safety margins (3.83 tpd) divided by the total MVEB for the SNAA without safety margins (17.12 tpd).
1.99 tpd X 3.83 tpd / 17.12 tpd = 0.44 tpd

9.5 Contingency Measure Implementation Schedule

The USEPA recommends that CMs take effect within 60 days of being triggered, and that the resulting reductions generally occur within up to two years of being triggered. New Jersey's designated CMs would take effect without further action by the Department. The USEPA would be able to immediately complete the process of either approving, or finding the new transportation conformity budgets adequate, and the emissions from transportation projects would then be constrained by the lower budgets applied to transportation conformity determinations.

9.6 Contingency Measure Conclusions

New Jersey demonstrates that it has met its CM requirements for both RFP and attainment for the Southern NJ-PA-MD-DE Nonattainment Area.